THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

VOLUME 13
(1954)

Edited by
B. R. STALLWOOD

The Amateur Entomologists' Society
1 West Ham Lane, London, E15

INDEX

Compiled by A. BLACKBURN (1715)

CONTRIBUTORS

SUBJECTS

INDEX OF NAMES

NEMATOMORPHA

ARACHNIDA

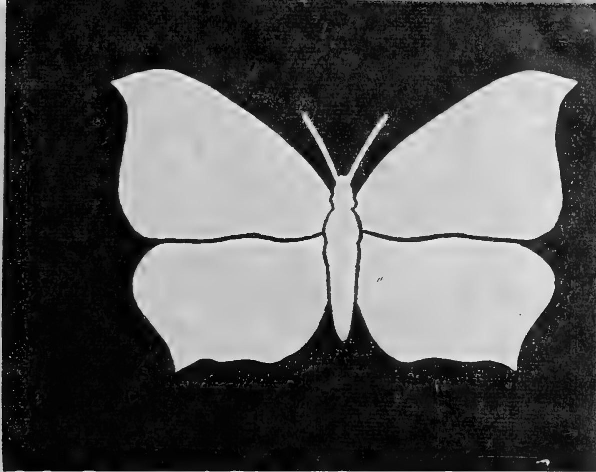
INSECTA

Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. 1955.

VOL. 13

No. 157

JANUARY - - 1954



THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

EDITED by B. R. STALLWOOD

AES BULLETIN
No. 157
JANUARY 1954

THE LEPIDOPTERIST

(*With acknowledgments to Mr. Ogden Nash and* THE NEW YORKER)

The lepidopterist, with happy cries,
Devotes his days to hunting butterflies.
The leopard, through some feline mental twist,
Would rather hunt a lepidopterist.
That's why I never adopted lepidoptery:
I do not wish to live in jeopardoptery.

PRESIDENT'S MESSAGE

This *Bulletin* will arrive, I hope, on the breakfast tables in Britain, at least, before you have had time to break any new resolutions and while you are still in the mood to look ahead. In each recent year the AES has taken some new step forward and has consolidated old ground. What of 1954?

One recent innovation is the London Meetings Group, which holds monthly meetings on Saturdays at 6 p.m. with a talk on some aspect of entomology followed by discussion and a display of exhibits. Perhaps other centres will try out the idea, possibly with smaller groups meeting in one another's homes. There is more fun and more success in entomology when it is shared.

That leads me to suggest that more use should be made of the Membership List, which will appear again in April. I know that some members already look upon this list as one of the most valuable assets of the AES. Make sure that you know all the other members within a reasonable radius of your home. Maybe you can organise a meeting, especially a field meeting, and possibly a Group. And before you go on holiday, write to the local members and ask if you may call on them. The holiday will be the more enjoyable if you can. (*If you want to amend particulars relating to yourself in the List, you should write to Mr. Byerley immediately.*)

I have another suggestion. Your honorary officers devote many hours to the job of helping the Society to tick over, even to the extent of neglecting their own entomological interests. I am sure you would wish to help. You can, in two ways at least, by paying your subscription at once (or sending in your resignation if that is the way you feel), and by writing articles for this *Bulletin* or getting other entomologists to do so. You see, just as the mercury vapour trap, by increasing the number of specimens captured, increases the number of " good things " taken, so the Editor would be able to select even better material for the *Bulletin*. After all, the Junior Members showed us last November what can be done, and I hear that we are to have in this issue a contribution from an over-80 member.

Speaking of the editorship, I would draw your attention to the new name on the cover. Mr. W. J. B. Crotch, who stepped into a breach nearly three years ago, has persuaded Mr. B. R. Stallwood to take over from him. The Council have, in turn, persuaded Mr. Crotch to remain as General Editor, looking after future Handbooks and Leaflets. I am sure you would wish me to express our thanks to Mr. Crotch for deeds past and to Mr. Stallwood for deeds to come.

Finally, may I remind you that the Hon. General Secretary is always glad to have new ideas for improving the Society, which he will bring before the Council.

L. W. SIGGS (243).

THE "SOUTH LONDON"

The South London Entomological and Natural History Society honoured the AES by inviting us as the Guest Society to their Annual Dinner on 30th October. Many kind things were said about the success of the AES in fostering an interest in entomology among beginners. It was suggested that we are probably the largest entomological society in this country. Quite a number of those present were members of both Societies.

RESPONSES OF *STRYMON W-ALBUM* Knoch.

For the last three years I have been carrying out an ecological survey of Battlestead Hill Wood, Tatenhill, near Burton-on-Trent. During this time, a variety of interesting points have been noted, one of which is given below.

It is in this wood that the White letter Hairstreak, *Strymon w-album* is found. (This is probably the colony mentioned in South's "Butterflies of the British Isles").

The accompanying map will help to illustrate my point.

It was noticed that the butterflies, in the morning, were to be found only on the eastern side of the hill, flying round the Elm (*Ulmus glabra*). They first began to appear about 6 a.m., by which time the sun was relatively strong (as it was July).

No butterflies were to be found on the relatively cold west side.

As the sun moved to the west, the butterflies moved accordingly with the sunlight, but, although the whole of the south and west sides of the wood are composed of elm, no butterflies were seen here. Most of the butterflies moved to the north west side, where there is a dominant shrub layer of Bramble; in favourable years the bramble flowers are covered with *S. w-album.*

In the afternoon, when the eastern side of the hill was in shade, no *w-album* were to be found there.

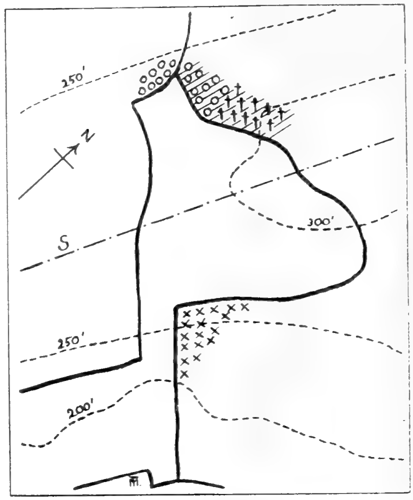
The sun provided a further effect on the well populated N.-west side. In the early afternoon, only the bramble bushes on the lower part of the hillside were illuminated, and *w-album* was confined to this region. As the afternoon progressed, bramble bushes further up the hillside were illuminated, with the result that the butterflies spread progressively up the hillside.

Finally, by 5.30 p.m., although the sun was still relatively strong, practically all the butterflies had disappeared.

This made me wonder what factors were involved; three of the possibilities that occurred to me are given below.

(a) Light, duration. This occurred to me by way of the fact that one can have 'long-day' and 'short-day' plants, which require long and short periods of daylight accordingly. It seemed uncanny that the butterflies appeared almost 'on the dot' at 6 a.m., and disappeared at 5.30 p.m., every time

Distribution of S. w-album: Battlestead Hill Wood.



// *Distribution of Bramble*
× *Distribution of* S. w-album. *A.M.*
o ,, ,, ,, *P.M. (early)*
† *Extension* ,, ,, *P.M. (late)*
S *Approx. summit of hill*
Scale : 12·5 in. = 1 mile (approx.)

I visited the spot. I think the phenomenon is more probably linked up with:—

(b) Light, intensity. I am ignorant as to whether my next assumption is correct, but if not, I hope members will put me right. Possibly the butterflies have a photoreceptor mechanism, which reacts to the intensity of illumination at 6 a.m. and 5.30 p.m. It would be interesting to compare the intensity at these times by means of a photo-electric cell. Perhaps some insects have a mechanism almost analogous to that found in Vertebrates, and which controls the breeding season[1]?

(c) Temperature. The effect of heat is probably only to make the insects more active, but its effect is probably linked directly with that of light intensity, since on a hot, dull day, no insects are to be found flying. On a relatively cold day, when there is strong sunlight, many butterflies are found flying.

The only really effective way to verify these assumptions is by carefully controlled experiments, which, if possible, I hope to try in the case of (b) and (c). I would be very pleased

if any members could direct me to any literature on the subject.

M. T. TANTON (1890*).

[1]'Times' Science Review, No. 9. Art.: 'Seasonal behaviour' / by Prof. Zucherman.

LETTERS TO THE EDITOR

Dear Sir,

Acting on Mr. Trevor Trought's hint in *Bulletin* **12**, 50, I write in appreciation of the article by Mr. C. H. E. Wiltshire (2098) in the same number. It is true that I possess a very expensive apparatus, equipped with 10 different lenses, a prism, and threads, screws, nuts, and joints innumerable, with which it is possible either to make a reduced sketch of a vast landscape, or a much magnified drawing of a small object. But it reminds one of the very early wireless sets in which there were so many controls to adjust and re-adjust that the programme was finished before one had successfully tuned it in.

Therefore, having a choice of suitable lenses, I went out to my workshop almost immediately after reading Mr. Wiltshire's article, and made the apparatus. It is very easy to make and use, and works admirably. Two slight alterations I made. First, a slot in the tube, so that I can use one or another of my lenses. Secondly a " fine adjustment " for the focus. The latter consists of a split block at G in the drawing, one half fixed and one movable, with springs between them, and an adjusting screw.

Gratefully,

A. L. H. TOWNSEND (1691).

Dear Sir,—I think Mr. Chapman's article (*Bulletin*, **12**, 79-82) on the seven *Vespula* wasps was splendid; it would be excellent for an adult, but is wonderful for a junior member. Any members of the AES who were interested may care to know there are two first class coloured plate pamphlets issued by the Ministry of Agriculture and Fisheries, 10 Whitehall Place, S.W.1—one on wasps and another on Ladybirds, Lacewings, Hoverflies, Ichneumon and Tachinids. When first published in 1924 they cost 4d each post free. The wasp one is "Miscellaneous Publications No. 44."—Yours faithfully,

W. J. WATTS (240).

HONORARY MEMBER

The Council have elected Mr. E. E. Syms, F.R.E.S., as an Honorary Member in recognition of his services to the Society. Mr. Syms, who is well known in entomological circles in London, has represented the Society on the Committee for the Protection of British Insects, and has been a regular speaker at our Annual Exhibitions. He is always particularly ready to help the younger entomologist and has the interests of the AES very much at heart.

SILK MOTH LONGEVITY

The Silk moths are totally devoid of mouthparts and cannot therefore take any form of nourishment in the perfect state. They are necessarily short-lived in consequence and seldom endure much more than a week. Keeping them cool and completely inactive will prolong life: Mr. Crotch (1181) told me of a female *Antheraea pernyi* which lived sixteen days.

We are maintaining in public view in a branch of Kensington Public Library a stock of *Philosamia cynthia obscura* which he gave to us originally. I think it may interest members to know that one female emerged on September 15 and died on October 23; and another came out on September 16 and lived until October 22. They were kept in a cage under conditions of both light and warmth.

Some larvae which were offspring from these two moths escaped a few days before spinning up and, before they were discovered, ate up most of a begonia plant, flowers and all. The colour of the silk cocoons of these is richer than the rest. Did the begonia do it?

N. E. YOUNG (2271).

[Mr. Crotch comments: " The longevity described by Mr. Young is astonishing, particularly under the conditions of the Library and especially because the females had paired. Nature preserves for as long as possible the unpaired female, but the adult which has laid her eggs usually dies a day or so afterwards. I do not think that the begonia influenced the colour of the silk. The race of moth is a hybrid one, not definitely *obscura*, and congeners have given me pure white, papery grey and orange silks."—ED.]

SCIENTIFIC METHOD IN ENTOMOLOGY

It seems that the Editor has been slack in allowing the publication of " debating point " jibes at professional biologists. Mr. John Moore writes (*Bulletin*, **12**, 75) " Professor J. Z. Young, presumably a biologist." This is cheap and unwarranted, especially as he then goes on to criticise a quotation from one of Professor Young's books; a quotation that he had not even bothered to verify, for, had he done so, he would have found that the words were taken from the introductory chapter to a book of seven hundred pages describing " The Life of Vertebrates." The whole book may be considered to be an attempt to define the life of a particular group of animals. If this is thought to be a somewhat excessive definition, it is perhaps well to remember the words of Mencius—extensively learn and in all detail state, so that one may later distil its essence.

Mr. Moore also seems incapable of dealing with the quotation as a whole: he has to take it to pieces and then say of each piece, without relation to the other pieces, "This is not complete " or " This is obvious." One deduces that he is not familiar with even the elementary books on biology, most of which give the characteristic " activities and processes " of living things referred to in the quotation.

J. Green (1044).

However distinguished a scientist may be, it is still incumbent upon him to present his communications in clear and decent prose. Having re-read the paragraph in question, I still think that it is far from lucid and that it fails to give a complete or accurate definition of those processes which we call " organic." If it was not meant to do so I owe an apology to the Professor; and so does Mr. Bradley, for it was he who quoted the paragraph in reply to a challenge by Dr. Fraser that he should give a biologist's definition of " life." The challenge may have been unfair; for obviously we do not yet know what " life " is, though we know a great deal about its various manifestations. All I ask is that scientists shall approach with proper humility those matters which they do not fully understand; and that when they seek to instruct us they shall remember that words well used are part of the armoury of science. The whole learning of Darwin would have been wasted if he had not taken the trouble in " The Origin of Species " to present his massive argument in a form which the average educated person could comprehend.

John Moore (146).

I am grateful to Colonel F. C. Fraser, if only for the thought-stimulating qualities of his letter (*Bulletin*, **12**, 74). This definition of life, though! He suggests that life is a slender thread (so is a piece of cotton), and then merely goes on to do as Prof. Young did and state some of life's characters.

I think that if we remember the law of the 'Conservation of Energy', then we have a key; this law states in effect that:—Matter is neither created nor destroyed, it is merely converted from one form into another.

Life, in one respect, can be visualised as a force, just as heat and light are the products of mechanical or chemical energy—so is life.

The skeleton of an animal or tissues of a plant are, so to speak, merely the moulds or containers in which chemical energy is converted, in part, into mechanical energy.

Taking the same principle in another direction, " A " under stress insults "B", thus triggering "B's" adrenal gland, adrenalin finds its way into the blood stream and we all know how this chemical energy built up within us is released frequently as strong expiratory words or, in certain cases, in mechanical action which brings us back again to the original stress.

Our Creator, God, to my mind, started us off with so much of each form of energy and arranged a whole series of chain reactions, as the lyric composer of ' Ilkley Moor Ba Tat ' seemed to realise.

Edric Higginbottom (2266).

[I feel that members who have studied the contents of the *Bulletin* over the past two years will have no difficulty in believing that Mr. Crotch would not have wished either

to give offence to a distinguished biologist, whose reputation is international, or to decry scientific writing. Mr. Moore has made his rejoinder above. I feel that the correspondence should now cease.—Ed.]

COLLECTING DUNG BEETLES (1)

Having specialized for some time on the smaller dung beetles, I use certain methods of collecting and preservation which have proved very successful and which may be of interest to other collectors of insects from this particular " food plant."

The true dung beetles of the genera *Aphodius* and *Onthophagus* are better collected and brought home alive in damp moss. I use small wide-mouthed jars such as those used for hand cream or shaving soap, which are packed tightly with damp clean moss. The beetles need only be dropped on to the top surface and they will immediately burrow to the bottom and when taking beetles in quantity from dung there is no need to replace the lid after each individual capture.

A considerable number can be collected into one jar and on the way home, as the jar changes position in haversack or pocket, the beetles will always move downwards, so that they become perfectly clean after a few hours. If they are collected into tubes or killing bottles without moss the containers become fouled and once the dung has dried on the insects they are very difficult to clean.

Upon reaching home or any time up to 24 hours later, the moss should be tipped out on to a large sheet of newspaper and the live beetles brushed into 2" × ¾" glass tubes with a small brush. They will not attempt to fly, except in a very bright light, and will be shining and clean and the dung in their gut will have been evacuated. With the glass tube not more than half full of beetles one drop of ethyl acetate should be introduced on a small piece of blotting paper, after which the tubes should be well corked. Killed in this manner, the beetles will remain clean, dry and relaxed in the tubes for weeks. After carefully going through the moss to make sure all the smaller beetles have been shaken out it can be replaced in the jar and used many times over.

" Small " dung, such as that of deer and sheep, is best worked by hand. The piece should be picked up by the dry upper surface and worked through with a penknife from the softer under-surface. Some species will remain in the dung until it is dry all through, in which case it can be broken up between the fingers. The ideal instrument for working cow and horse dung is an ordinary kitchen knife. It is best to start by turning over the complete heap (when possible) and then work from the underneath and it pays to work patiently right through the heap, as certain species seem to favour certain depths and others are found up to one or two inches in the soil underneath.

The British species of Aphodiinae (which number 50 according to the accepted lists) have been somewhat neglected in the past and their distribution has not been adequately studied. They include a few of our rarest British beetles but, unlike phytophagous species, there is no reason to suppose that these rarities have died out.

(*To be continued*)

L. S. Whicher (1345).

LOOKING BACK

Looking back over many years of collecting, I have vivid recollections and happy memories. I remember when, as a small boy, with the aid of a home-made net fitted with a long cane stick, I chased *brassicae* and *crataegi* or Humble Bees and Dragonflies. Every insect in flight fascinated me in those days. I have ever felt indebted to a benevolent aunt who presented me with a copy of Coleman's " British Butterflies " (bound in cloth, one shilling) during my early school days. I still possess this excellent little book and prize it very highly. It was my guide and *Vade mecum* for some years and helped me to tread the early paths to the study of Entomology.

I have recollections of primitive methods of breeding larvae and setting butterflies; of improvised store boxes; and the hundred and one difficulties encountered during my school days; and how the collection of one summer seldom survived the advent of the next.

After leaving school, I went into business and life in lodgings in a

London suburb was not conducive to the pursuit of entomology. The embryo existed, however, and when after ten years I married and found myself living in a house with a small garden on the outskirts of an industrial city, the urge to pursue my hobby came bubbling up and with the acquisition of a cabinet and help and encouragement from my wife, I started to collect seriously. Opportunity was, of course, restricted to week-ends and one short annual holiday.

How happy were those week-ends when we explored the moss, the heath and the woods. In contrast were those disconsolate ones, when after working the week through in the sweltering heat of bright sunny days, our plans were wrecked on account of a cloudy sunless day at the end of the week.

We usually spent our holiday in the New Forest district and our hunting grounds were the heaths and downs and woods of Hants, Wilts and Dorset—those glorious downs, where we lived for a few short hours with *coridon, bellargus, cinxia* and *aurinia*.

I have happy recollections, too, of the New Forest as it was in the days before the first World War, when oak trees were tolerated in the covers and before economic planning demanded their ruthless destruction in order to provide space for large areas of symmetrical rows of conifers. When the drives were veritable fairy glens, where *paphia* and *camilla* congregated on the bramble bloom and other denizens of the butterfly world availed themselves of nature's provision. To-day these happy conditions are a thing of the past. The natural drives are fast disappearing and are either replaced by broad gravelled roadways, drained by deep ditches on either side, or so damaged by tractors used for hauling timber that negotiating the deep waterlogged ruts created by their wheels renders walking laborious and most discomforting. Many drives, too, are flanked by long stretches of wire netting erected to guard the precious conifers.

Ah, well! I suppose the community demands pit props and telegraph poles, so it is inevitable that sentimental aspirations submit to commercial considerations. I am grateful that I had the privilege in the past of wandering in the unspoilt woods and rambling over entrancing downs which to-day are cultivated and irrigated.

Now I find myself a lone widower, approaching that period in life when I qualify to be classed an octogenarian and I suppose if I wish to be a sedate and creditable member of that fraternity my correct procedure will be to spend my time leisurely in an easy chair and endeavour to stimulate what mental faculty I possess by studying scientific literature and contenting myself with past memories. This, however, is not my intention, at any rate as far as I am permitted to plan my destiny. Unfortunately an arthritic hip somewhat reduces my physical activity, but I still often find myself, stick in one hand and net in the other, visiting the old haunts on the downs, and not infrequently an indiscreet var. settles within range of my net. The examination of the contents of my m.v. moth trap is a source of interest and pleasure, and in this way I secure many specimens which I find useful for patching up or completing series in my cabinets. My breeding cages keep me busy during many months of the year and I derive some pleasure and satisfaction when I succeed in hibernating "those difficult larvae."

I am blessed with good sight and hearing and attribute my present physical fitness, in some measure, to the fact that during my life I have pursued a hobby which has afforded me healthy recreation in the open air and kept my mental faculties alert.

P. Maggs (244).

SOME INTRIGUING PROBLEMS

(I)

One of the most fascinating aspects of the study of any branch of Natural History is the frequency with which one comes across problems of one kind or another. Some of those problems have been solved and one can find accounts of their solution if one knows where to look; others have not been solved yet, and some probably never will be. It is a good thing that any such problems should be widely discussed so that many people's minds may work upon them, and it is with that intention that some questions which have been lately exercising the writer's mind are being put into print.

A curious problem concerns certain species of the *Satyridae* in West Cumberland. The species concerned are *Eumenis semele* Hübn. (the Grayling) and *Maniola jurtina* Linn. (the Meadow Brown) and the problem centres upon their different times of

emergence in two different parts of the coastal strip. This strip of coastline consists of low cliffs in its northern portion from Maryport to Seascale. The cliffs become much higher and precipitous at St. Bee's Head. The rock is chiefly sandstone of the coal measures (of Carboniferous age) above Whitehaven, and consists of St. Bee's Sandstone (Triassic) below Whitehaven (and it is with this part that we are concerned). South of Seascale an extensive area of sand dunes develops and the ground for the first mile or two inland is much flatter. Between Drigg and Ravenglass the sand dunes reach their finest pitch of development and they support a truly amazing profusion of insects among which are the two species of butterflies in question. But the strange thing is that here, among the sheltered hollows in the dunes, they both appear on the wing considerably later than on the far less sheltered cliffs and sea banks a few miles further north. In this northern part of the coastal strip in question, around St. Bee's, *M. jurtina* appears about the third week of June and is over by the beginning of August. It is single-brooded throughout the area, any second-brood specimens being extreme rarities anywhere in N.W. England. *E. semele* appears about the first week of July and is only represented by hopelessly worn specimens by the middle of August. These dates are typical for both these species throughout this part of the country. But on the Drigg sand dunes *M. jurtina* is in perfect condition in the first half of August and *E. semele* can be found in good condition almost at the end of the month. This year the writer paid a visit to the sand dunes on August 12th; *M. jurtina* was in an absolutely fresh condition and pairing was taking place; the same remarks are equally true of *E. semele*. A few worn specimens of each species were seen, but the majority had just emerged. On the same day in the St Bee's area practically no *M. jurtina* or *E. semele* were left at all, and those that still were on the wing were tattered almost beyond recognition. Indeed, from the very beginning of August there had been no fresh *M. jurtina* there and only a very few fresh *E. semele* had been seen in the first ten days of the month, so that both species had clearly passed their peak before the end of July.

Lest it should be thought that some particular conditions had produced this effect this year it must be made clear that the same peculiarity has been noticed to an equally pronounced extent on previous occasions, and other entomologists have noted it as well. It certainly suggests that the two species are remarkably sedentary, for if there was an interchange of specimens this difference in their dates of emergence could hardly exist. It would be most interesting to know if anything similar has been noticed elsewhere, and also whether any plausible theory can be suggested to account for this strange discrepancy in the time of emergence in colonies so very close to each other.

J. H. Vine Hall (1520).

•

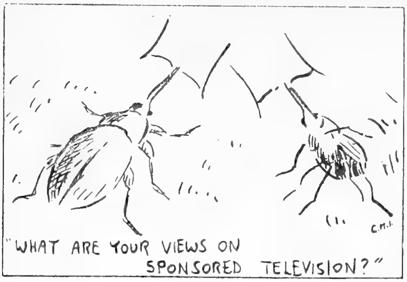
SETTING HINTS

A Double-ended Setting Needle. I do not know if the idea is original but it was suggested to me by Mr. F. R. Sutton (538) and we have found it very handy in use. The handle is a 4″ length of $\frac{3}{16}$″ diameter wood dowel. In one end a piece of brass wire, suitably tapered, is forced leaving about 1″ projecting. This is the ordinary setting needle. A similar piece of wire is fitted to the other end of the handle but this has the last $\frac{1}{16}$″ bent at right angles. This provides a hook for arranging legs and on occasion the outer curve of the angle can be used to hold wings in position. I find brass preferable to steel as it does not rust; it is quite strong enough.

John E. Knight (94).

Pith. For the grooves of 'micro' setting boards and for a pinning block I find artichoke pith most suitable. Gather the stems of common or garden artichoke (the species of which the root is eaten) in December when it is quite dead. Dry indoors, cut into convenient lengths and split off the hard outer covering with the thumb nail. The resulting cylinder of pith can be cut into strips with a razor blade. If these are made oversize they can be forced into the groove of the board and no adhesive is necessary; replacement when required is therefore easy. The pith can be smoothed with *very* fine glass-paper. In cutting from the raw a lot of material is wasted but plenty should be available, and the thicker the stems the more easy they are to handle.

John E. Knight (94).



By C. M. Idle (2118*)

OBSERVATIONS

CLOUDED YELLOW IN RHODESIA

T. J. Rutty (2114*) reports an interesting statement by a correspondent of his who lives in Southern Rhodesia, that a butterfly exactly similar to the Clouded Yellow (*Colias croceus*) of our Islands is flying there.

[*Colias croceus* occurs in N. Africa, but in South and Eastern Africa it is replaced by *Colias electra*, a closely-allied species. It is not impossible that the two species may occur together at the limits of their respective ranges.—Ed.]

FRATERNISING BUTTERFLIES

On the 15th October last year, I found in an old school air-raid shelter, presumably just beginning their hibernation, twenty-five specimens of *A. urticae* and seven specimens of *V. io.* I took these, which were in an area of about one square foot, home to my own room at my house; my reason for doing this was to prevent them from being found and undoubtedly tampered with by the many boys at school who use the field adjoining the shelter. After putting them into a bag I took them home and released them in my room where within one hour they had arranged themselves again in a similar small area and settled down once more to hibernate. Is it usual for these two species of butterflies to hibernate together in such a friendly manner and in these large colonies?

T. J. Rutty (2114*).

REVIEW

The Behaviour and Social Life of Honeybees. By C. R. Ribbands. Pp. 352; 9 plates; 66 line drawings. Bee Research Association Ltd., 1953. Price 21/-.

The Bee Research Association are to be congratulated on the quality of their third publication. It maintains the high standard they have already set.

The bee has had more books written about it than any other insect, but here is a book that is different. A book full of facts. The findings of over 450 research workers in all parts of the world have been drawn on. Details of experiments in training bees to colour, shapes, temperature, scent and even time are given. How a bee orientates itself, recognises its fellow hive mates, produces wax and controls the temperature in the hive are all questions that are answered in an excellent way. Mr. Ribbands has made this book interesting to the layman as well as to the expert by the delightful style of his writing. To the research worker I would say this book will make a fine companion volume to "Snodgrass"; to the layman, you will not find another book so comprehensive. It contains 19 tables, 66 figures and 9 plates of photographs which are of high quality, in keeping with the text. Plate 2, "Honeybee gathering pollen from columbine", and plate 9, "A forager on sweet clover", I would term works of art.

The three indexes cover (a) References (indication is given if they are available in the B.R.A. library), (b) Authors and (c) topics.

B. L. J. B.

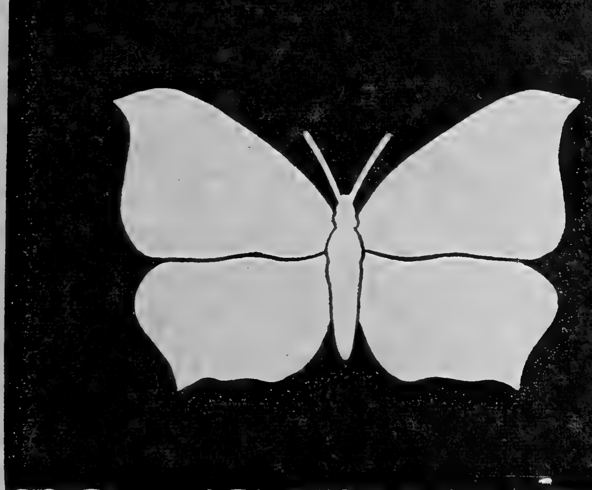
Professor Fungus **By G. S. Kloet**

Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. 1953.

VOL. 13

No. 158

FEBRUARY - 1954



THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

EDITED by B. R. STALLWOOD

AES BULLETIN No. 158 FEBRUARY 1954

SOME INTRIGUING PROBLEMS (2)

If one looks up *Chloroclysta miata* Linn. (the Autumn Green Carpet) in the text books, one finds it stated that the species emerges from the pupa in the autumn, and can then be found at ivy bloom, and, after hibernation, it can be found at sallow catkins in the spring. This account does not appear to tally with the state of affairs here. In this neighbourhood, in South Westmorland, the moths begin to appear in the autumn about the middle of September (13.9.52, 17.9.53) and, though it is true that they can be found at ivy bloom, they are much commoner at light — an average of about ten come to my mercury vapour trap on any reasonably good night. The species lasts until November, when in the first few days of that month the final few hopelessly worn specimens are seen. From then on imagines are absent until early May. In that month absolutely fresh specimens begin to appear (4.5.52, 5.5.53) and they continue on the wing until early June. But (1) these spring specimens are not nearly as frequent as the autumn ones, and seldom even on a good night do more than two appear; and (2) they are strikingly different in ground colour from the autumn specimens, being of a pale delicate green, resembling spring foliage, whereas the autumn colouration is chiefly of a hard shade of green, almost a bottle green in many instances, somewhat like the old dusty leaves of autumn.

It is true that autumn specimens are frequently paler than the foregoing description, but they never seem to assume quite the same shade or hue as those which appear in the spring. Therefore it does not appear that the species hibernates in the perfect state at any rate in this area, for no worn specimens ever appear at sallow bloom time. The fresh specimens in May are, of course, too late to coincide with sallow time. What is the interpretation of these facts? Personally, I admit I am perplexed by them. The species cannot be double brooded in the ordinary sense of the term, because (1) the spring specimens are so infrequent compared with the autumn ones—at most it is a partial brood, and (2) it is hard, if not impossible, to conceive that the full metamorphosis could take place between that latter half of September and the first week in May, for the leaves upon which the larvae depend for their food are hardly present on the trees during this period at all. Several double-brooded species are on the wing in late August and early September and then appear again in the middle of May, but in this climate and latitude a quicker metamorphosis in the winter months can hardly be achieved. Further, such species are mainly ones which depend upon small plants or evergreens, such as pine, and not on the larger deciduous trees.

I cannot help wondering whether a certain number of specimens do not emerge in the autumn, but wait until the spring, and that actually the full year is required for their metamormorphosis. One would think it likely that spring specimens of one year would give rise to spring specimens of the next year, and likewise that autumn specimens would produce autumn specimens. In fact, if this is so, we have here the first stage towards the formation of a fresh species, rather on the same lines as the divergence of *Ectropis bistortata* Goeze, and *Ectropis crepuscularia* Hübn., though a very few weeks' difference in time of emergence is involved. I very much doubt if any conclusions could be reached by breeding, as probably only a very slight upsetting of the natural conditions would alter the time of emergence artificially and render the experiment worthless. But it would be interesting to know if anything similar has been observed elsewhere, or if the same state of affairs exists in *Chloroclysta siterata* Hufn. (the Red-green Carpet) about which the text books make identical remarks. This species is very scarce here by comparison with *C. miata* and I have seen it only in the autumn, so I can offer no evidence of any value. But *C. miata* certainly poses a problem.

J. H. VINE HALL (1520).

SPIDERS

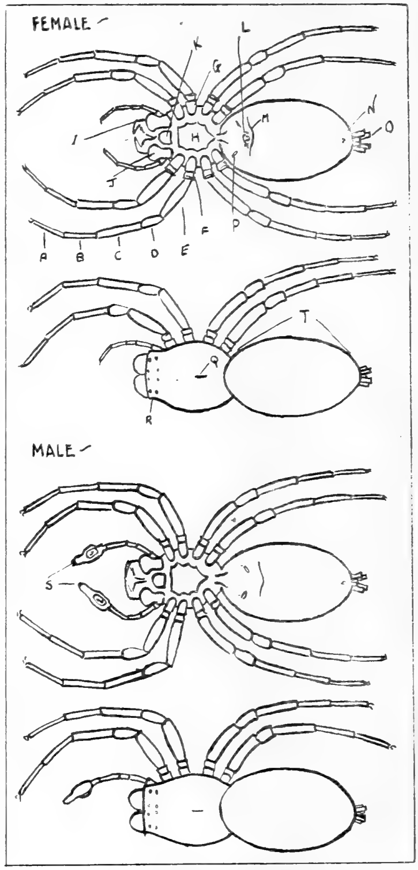
There are, it is true, upwards of 50,000 different species of spiders in the world, but in Britain the numbers are considerably less. Our 560 odd species, however, might well seem a formidable study, if it wasn't for the fact that they can be separated into five main groups without much difficulty. One quickly learns to distinguish the Weavers, the Wolf Spiders, the Crabs, the Jumpers, and the Trap-Door Spiders.

It is a reasonably straightforward job, with the aid of a good key, to establish the family and also the genus of a spider. The number of eyes and the eye pattern, the presence or absence of different shaped spines and their disposition on the body or legs, the relative length of the legs, the general colouration of the spider, are all things that can be noted with the aid of a good pocket-lens. However, it is a much more difficult matter to determine the species, and one often has to subject the genitalia to a microscopical examination in order to do this. As the sexual organs of spiders are not fully developed until the last moult it will be realised therefore that an accurate determination of the species can usually only be made in the case of adults.

The sexual differences of spiders are quite apparent in that the male bears a very complicated process on the tarsus of the 'pedipalps', which are the second of the two pairs of appendages of the head. This organ is used in transferring the semen to the female at the time of pairing. The palpal tarsus of the female spider, however, resembles the tarsus of an ordinary leg, except that it is only a single segment. The sex organs in the female are situated in the abdomen and open on the line that is called the 'epigastric furrow'. These organs are referred to as the 'Epigynum'.

The pairing of spiders is a rather interesting procedure, and this function is preceded by the spinning by the male of a small web, sometimes rectangular, sometimes triangular, called the sperm web. He deposits a globule of semen upon this silken mat from a very small and almost invisible orifice in his abdomen. His next job is to charge the 'receptaculum seminis' of the palps with the semen that he has deposited on the sperm web and then he is ready to begin his courting.

The pre-nuptial behaviour of spiders varies greatly in the different species



A TYPICAL SPIDER

(A) *Tarsus*
(B) *Metatarsus*
(C) *Tibia*
(D) *Patella*
(E) *Femur*
(F) *Trochanter*
(G) *Coxa*
(H) *Sternum*
(I) *Chelicera*
(J) *Maxilla*
(K) *Labium*
(L) *Epigyne*
(M) *Epigastric Fold*
(N) *Tracheal Spiracle*
(O) *Spinnerets*
(P) *Lung Spiracle*
(Q) *Fovea*
(R) *Eyes*
(S) *Male Palps*
(T) *Abdomen*

and much has been written about it. One of the Crab Spiders, *Xysticus lanio*, is said to tie up the female before accomplishing his desires, some of the Wolf spiders wave their front legs about as if they were signalling with them, and many of the *Salticidae* or Jumping Spiders do a sort of dance often lasting for an hour or more. The papers of Mr. and Mrs. Peckham are well worth reading for their accounts of the mating habits of these individuals. Some members of other

families have developed even more cunning tricks, for instance one, *Pisaura mirabilis,* takes the trouble to wrap up a parcel in a silken web, and hands it to the lady of his choice. To be true, the present is only a dead fly, but it is sufficient usually to get him accepted as an eligible suitor. The female *Drassodes lapidosus,* one of the large spiders that live under stones, is very strong and formidable. This fact has caused the male to develop his own courting technique and this is to select an immature female and to keep her captive until her last moult. Then whilst she is still in a weak state he is able to overpower her without any risk to himself.

From early summer until late autumn it is quite easy to catch many types of Wolf Spiders and the females are usually to be found either carrying their cocoons around with them, or else with a brood of youngsters upon their back. Our British species only carry their young for about a fortnight, but *Lycosa narbonnensis,* the Black-bellied Tarantula of Fabre's memoirs, carries her offspring with her wherever she goes, for a period of six months or more. Even the method of carrying the cocoons varies in different families, for example the *Lycosidae* attach theirs to the spinnerets, whereas the *Pisauridae* use the chelicerae or fangs.

Most people are familiar with at least some of the Web Weavers. The Orb web that one sees in the garden is a sure sign that *Aranea diadema* has been at work, the dirty looking cob-webs that hang in the corners of the shed or cellar denote the presence of *Tegenaria,* and that hammock-like web that one meets almost everywhere, is the product of one or another member of the family *Linyphiidae.* The spiders of this family are usually to be found walking upside down underneath their webs. There are a great many species, most of them very small and on this account they present some difficulty to the beginner. The smallish bluey-grey flocculent sort of web spun over a hole in wood or brickwork is probably hiding *Ciniflo,* a spider that is provided with extra spinning equipment called a *cribellum.* These cribellates have, in addition to this, a comb of spines on their fourth leg, and it is this that gives the carded effect to their web. The smallness of this web, however, is no indication of the spider's size, for *Ciniflo* is quite large in proportion. And so one could go on, for the study of Spiders, or, to give it its correct name, 'Araneology', is one of the most interesting subjects that one can take up and apart from being a comparatively inexpensive hobby, it has the advantage of combining both summer and winter activity. There are many excellent books available if one wishes to delve a little deeper. Bristowe's 'Comity of Spiders; Savory's 'Spiders and Allied Orders of Great Britain': and Locket & Millidge's 'British Spiders', are well worth reading.

G. J. Ashby (2252).

•

EXCRETING HABITS OF *FORFICULA AURICULARIA* L.

Looking through Lucas' *British Orthoptera,* London, 1920, to-day I noticed on page 51 the following note concerning the Common Earwig in a tent at an Army camp at Newmarket in 1916:—

> "Every day *F. auricularia* sought refuge up the ridge-pole, where they must have been in thousands. From this elevation they used in the day-time to drop excreta. Out of curiosity he (O. Whittaker) one morning placed a piece of paper on a table directly beneath the ridge-pole. It was left for an hour, and, when counted, the number of spots of excreta was found to be 'three score and eleven'."

My own recent experience tends to confirm this behaviour of the earwig. In my new house the plasterers carelessly left a small hole in the ceiling at the top of a bay window. The space above the ceiling and and below the bedroom floor boards became, during the erection of the house, a home for great numbers of earwigs. After occupation and fitting the curtain runners I constantly found considerable numbers of excretal pellets on the window-sill below the runners. Contrary to Whittaker's observation the pellets were dropped at all hours of day and night and the earwig population was greatly reduced by raids upon them after dark when several at a time would be found on the runners.

Chemical action against the earwigs and less drastic action against the plasterer has resulted in the extermination of the colony, so no more observations can be made.

R. S. George (1402).

COLLECTING IN MALTA

Malta, the Jewel of the Mediterranean. How true this is, I did not realize until I became stationed here and started collecting insects.

From a general naturalist's point of view there need never be a dull moment. Although there are very few mammals, only rabbits, bats, hedgehogs, rats and mice, the flora of the island is beautiful beyond imagining, and the insect population is immense and very varied. Most of the insects here are new to me, so that, until I get them identified, I cannot hope to give a list of captures. Hemiptera of all shapes and colours abound, Coleoptera are many and varied, whilst the Odonata present many new species.

Of Lepidoptera, many species common with the United Kingdom appear here, viz., *Papilio machaon* (numerous), *Pararge aegeria* (common), *Maniola jurtina* (common), *Coenonympha pamphilus* (common), *C. tullia* (numerous), *Colias crocea* (numerous), *Polyommatus icarus* (common), *Lycaena phlaeas* (several), *Vanessa atalanta* (numerous), *Pieris brassicae* (numerous), *P. rapae* (very common), *Vanessa cardui* (numerous). The following, however, are said not to occur on the island, and I indeed have not yet seen any of them, but would not like to say definitely that they do not occur:—*Aglais urticae*, *Gonepteryx rhamni*, *Nymphalis io*, *Pieris napi*, *Polygonia c-album*.

There is very little literature on the natural history of the Maltese islands. There is only, to my knowledge, one booklet on the Lepidoptera of the Maltese Islands, by P. Borg, published in 1932. This is, however, full of errors and very misleading.

Here is a field for intensive work for entomologists. I am here for a period of only two years and can only hope to touch the fringe of it. Up to now I have only been able to collect. Study of habits, habitats and life histories are out of the question in such a short time. There is a lifetime of work for many people here. There have been proved to be several, previous unknown species on the island and that many more remain to be discovered, I have no doubt.

The collector is somewhat hampered by the shortage of supplies of apparatus and reagents. Cyanide is absolutely impossible to obtain, as also is benzene. Chloroform and ether are very scarce, and pins, cork and other essentials have to be imported from U.K., usually taking from six to eight weeks to arrive here.

In spite of all these difficulties, I find collecting in Malta extremely interesting. One never knows what is to be found on the next bush round the corner.

David H. Heppell (1690).

SQUEAKING PUPAE

Anyone who has bred *Acherontia atropos*, the Death's Head Hawkmoth, will be well aware that this large insect is able to produce quite a loud squeak. It is said, also, that the pupa can squeak, though I myself have never heard one do so.

This year it was brought to my notice by Mrs. R. Graves, of Valentia Is., Co. Kerry, that the tiny pupa of *Callophrys rubi*, the Green Hairstreak Butterfly, is capable of producing a faint though quite audible noise.

Mrs. Graves tells me that she first heard the sound, which she describes as a squeak or chirp, during the summer of 1952. For some time she had difficulty in tracing the source of the sound, but ultimately tracked it down to some pupae of *C. rubi* which she had in an open box on a table. Again during this year Mrs. Graves was breeding the same species and, once again, noticed the same sound after some of the larvae had pupated.

During the second week in August she kindly sent me two of her pupae and mentioned that though they were still capable of making the sound, it was fainter than it had been soon after pupation. On unpacking the pupae I found that after placing them on the palm of my hand and rolling them round slightly, I could hear the sound at a distance of about two feet. Personally, I should describe it as a faint rustling sound rather than a squeak. I could see no movement, under a lens, while the noise was being made. About a fortnight later the noise had become fainter still, and I could only just detect it when holding the pupae close to my ear. By the first week in October I could hear no sound at all.

I would be interested to know whether this phenomenon has been noticed before, and whether it has been explained.

E. S. A. Baynes (1221).

ONE OF THE LAST FEW

For those of us who collect the indigenous butterflies of this country there comes a time, usually after some years, when we have obtained the majority of species, either by net or beating for the larvae. One is then left with the last half dozen to get, for which long journeys and plenty of good luck are essential to every trip. The AES member in the North of the British Isles will probably obtain species such as the Small Mountain Ringlet (*Erebia epiphron*), Scotch Argus (*E. aethiops*) and Large Heath (*Coenonympha tullia*) in the first few years of collecting, but will have to make considerable journeys for the Large Blue (*Maculinea arion*), Lulworth Skipper (*Thymelicus acteon*) and Glanville Fritillary (*Melitaea cinxia*), etc. The converse applies, of course, to the collector in the southern counties.

I have, for the last five years, considered myself very fortunate if able to add another species to the collection. At the beginning of 1953 the three Northern butterflies mentioned above, and the Large Tortoiseshell (*Nymphalis polychloros*), had yet to be represented in my cabinet.

In June I managed to obtain *C. tullia* in Shropshire, a trip which was fully described in the October bulletin. It was after this I read that *E. aethiops* was to be found on the wing in August, a butterfly still high on my list of desiderata. Unfortunately, having taken my holiday period earlier in the year, I was restricted to a week-end for the 250-mile trip North. The chances of any success were very slender, sunshine being essential if this insect was to be seen on the wing, and the short period I had available did not allow time to wait for this condition if it did not exist on arrival. After much calculating with the ABC railway guide, I found it would be possible to leave London late Friday night and to arrive within walking distance of the locality early the following morning. Without going into the details of the train journey, I arrived at my destination in Westmorland about breakfast time, and as the sun was shining I lost no time in making my way to the area. The butterfly was well on the wing at 8 a.m., and by half an hour I had secured the few I needed for a series. After walking around for a couple of hours it was evident that the butterfly was abundant, and I had the pleasure of seeing the insect under ideal conditions. By late morning I made tracks for the station for the return journey, and at 6 p.m. had arrived back in London, rather tired, having completed a round trip of 500 miles.

I may add that a number of ova were laid during the journey in the glass-bottomed boxes in a manner described in Frohawk's " British Butterflies " (p. 56).

S. M. HANSON (320).

[In "Notes on 1953" (*Bulletin* **12**, 90) a reference is made to one of Mr. Hanson's articles entitled " Another Tale of a Quest" (*Bulletin* **12**, 73). This reference should, of course, apply instead to the above article. We offer Mr. Hanson our sincere apologies.—ED.]

•

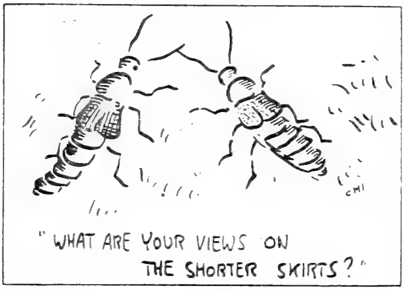
THE LONDON MEETINGS GROUP

The London Meetings Group held their first meeting on Saturday, November 14th, at the Cripplegate Institute. The President, Mr. L. W. Siggs, was in the chair.

Mr. E. E. Syms, F.R.E.S., our latest Honorary Member, gave an interesting talk on the "Amateur Entomologist", in which he traced the history of Entomology from the earliest days to the present time. He showed that most of the well-known entomologists have been amateurs, most of the eighteenth and nineteenth century ones being doctors. Mr. Syms remarked how the amateur assisted the professional by collecting the data for him to work on, and that, as most professionals were fully occupied with their own particular line of research, it was generally the amateur who wrote the more comprehensive books on Entomology.

A discussion followed the talk and exhibits were shown. Twenty members and two visitors were present. The meeting did not close till about 8 o'clock.

Mr. D. Ollevant, 3 Salcombe Drive, Morden, Surrey, agreed to act as Honorary Group Secretary, and further enquiries should be addressed to him.



By C. M. Idle (2118*)

SUGARING VAGARIES

Many years of sugaring have confirmed me in the opinion that the much vaunted mystical recipes for making the concoction are so much moonshine. Fowlers' treacle let down with beer, cheap wine, or fruit syrup, and doped with surgical spirit, rum and amyl acetate, has proved consistently successful for many years.

Trees, which have been regularly sugared during the season, are frequently sufficiently attractive even when the painting operation has been skipped an odd night or two. I had a curious example of this last year. About two miles from my house is a wood of about 400 acres, and on September 19th I sugared a score of trees, which yielded three Flounced Rustic, *Anchoscelis helvola*. On the 20th and 22nd sugaring as far as possible the same trees produced 30 *helvola*, together with a couple of Red Underwings and odd specimens of Dark Arches, Setaceous Hebrew Character and Green Brindled Crescent. After a lapse of six days another onslaught was made, but difficulty was experienced in identifying the trees again and, as a result, some of the old recipients were missed and fresh ones newly sugared; nor was the sugar applied in the same place in some cases.

Helvola was in profusion and over 80 specimens were observed, many of which ignored the freshly-applied sugar and settled on old strips six days stale, the most striking case being a large beech bole where the new strip was six inches from the old one. Here several moths completely ignored the fresh sugar and all congregated on the old patch nearly a week after anointment. Manifestly no sustenance could be derived from a strip where the mixture had long since soaked into the bark, so it was difficult to see wherein lay the attraction.

I was finally forced to the conclusion that they had all signed the pledge.

L. G. F. Waddington (169).

WHY?

During the years I have been rearing lepidoptera I have always wondered why things happen to me as they do.

I find myself carrying out rearing operations in exact opposition and with results differing from the normal run of things. I find myself breeding butterflies and moths that according to the textbook I should find very difficult, and yet another species has me completely beaten.

To illustrate my point, I was sent some larvae of the Clouded Buff a year or so ago, and when I looked up the species in South, it stated that it was extremely difficult to get through the winter, and that it was better to force them. So, to be different, I tried the harder path, and left them outside in a zinc gauze cylinder, and every one came through!

On the other hand, I have tried for three years running to get the Ailanthus to oblige me, a species which my learned friends in the Silk Moth Group look upon as one which they cannot help but rear, but not I. Yet another silk moth, the Golden Emperor, which was said to be difficult, I experienced no trouble with.

Turning again to the Tiger moth family, I find that people rear the Garden Tiger by the thousand in search of varieties, but very few of mine seem to survive. The Jersey Tiger, said to be difficult in the last stage, was to me comparatively easy.

These examples suggest to me that a lot of luck, besides common sense and carefulness, attends the rearing of a species, even a common one. One might try to rear exactly as someone else has done, and fail; yet treat a species roughly, and it may be successful.

I can see no other reason why I do not seem to be able to get the "easy" species through, yet have complete success with the "difficult" ones.

So long as my luck holds, I shall carry on the hard way!

C. J. Taylor (2055*).

LETTERS TO THE EDITOR

Dear Sir,

Thank you for your personal note on *Deilephila elpenor* Linn. larvae feeding on Clarkia. It is interesting to find that this species is turning voluntarily to another pabulum, but in captivity it can be induced to feed on any plants of the *Onagraceae*. I have fed it on Clarkia and on Balsam without any visible effect on the wing colouration of the imago. So long as Rosebay Willowherb remains abundant I do not think there will be any change of habit in *elpenor*.

My own efforts to carry out the plans I put forward in my article (*Bull.* **12**, 52) may encourage some beginners, who are shy of submitting their sparse records, to know that on August 13th, 1953, I searched a railway bank well covered with Willowherb for one hour and found only one *elpenor* larva, about half grown. I made another search on August 21st between 8 and 9 p.m., but found only two half-grown larvae. This was in the place where they were abundant last year. I selected a fresh locality and searched the willowherb carefully from 7.30 p.m. to 8.15 p.m. on September 2nd. In that time I found but one *elpenor* larva; I had to stop searching because the light failed.

I had decided that *elpenor* had become rare in Derbyshire when quite by accident and without searching I found eight fully-grown larvae feeding in the full sunshine at noon today (September 12th). It is this trick of not behaving according to rules, common to most animals, which makes it necessary to record even the most trivial event.

Yours sincerely,
J. H. Johnson (1840).

Dear Sir,

With reference to the note by Mr. F. H. Lyon (1026) (*Bulletin* **12**, 95), may I say that I have known Whixall (Fenns) Moss for over 50 years. I used to expect the first male *Coenonympha tullia* Müll. about June 18th to 20th and the female about a week later.

Why is this Moss always spoken of as in Shropshire? Half (Fenns), is in Flintshire, and half (Whixall) in Shropshire; and most visitors do not know which side of the almost invisible boundary line they are.

Why is this insect "found on the Shropshire *Mosses*"? To the best of my knowledge there is no other Moss in this county.

Yours truly,
E. S. Lewis (373).

"DON'T DO IT" TIPS

In the hope that other members will not suffer the annoyance that I have had, these experiences are reported as advice of what NOT to do.

When collecting beetles I usually put in the tube with the specimens a scribbled note giving the necessary data. Then, at home, the tube is uncorked, and placed vertically in a large tube or wide necked jar into which a little ethyl acetate is poured. The jar is corked and thus I kill several batches simultaneously, each with its own data. A small plug of cotton wool in the top of each small tube prevents the active species escaping from their own tube. The specimens are usually set on the following day when they are perfectly relaxed. But the snag comes when the data is written with a ball point pen, for the ethyl acetate fumes have the power of causing the ink to run on the paper and the writing becomes illegible, resulting in the loss of the data unless one's memory is infallible. If it is, why bother to write scribbled notes . . . . but my memory is far from infallible.

Part of my collection suffered from mites . . . other boxes got *Anthrenus* trouble and I determined to put an end to this. The collection was well and truly treated and now exists in an atmosphere of para-dichlor-benzene fumes (much to my wife's annoyance for she detests the smell). I decided to try out an idea to reduce the chances of further infection by mixing a small amount of mercuric chloride with my gum. I use an aqueous solution of methyl cellulose normally but occasionally use the standard tragacanth gum. What a mess it made!! My chemist friends explained the mess thus . . . mercuric chloride reacts with most metals (my setting needles for instance) to form a mass of droplets of the amalgam which seriously discolour the gum, and free chlorine which causes further discoloration. So DON'T do it.

R. S. George (1402).

BOOK REVIEW

Woodland Ecology. By Ernest Neal. 102 pp. 11 text figures. Heinemann Ltd., 1953. 6/-.

The author of this book is known to most people for his excellent work on the badger. He deserves to be equally successful with this venture into woodland ecology. The scope of such a study is tremendous, and Mr. Neal admits that the choice of subject matter has to be purely personal, and as such, is debatable, but he overcomes the immense size of his subject in a clear and concise manner. In thirteen chapters he deals effectively with most of the aspects of woodland ecology.

The book is divided into two main parts, relating to the flora and fauna of the woodlands. In the floral part, which covers 'Habitat Factors' and 'Floral Composition' of a particular wood in Somerset, the author shows how to apply his methods of study to other woods. Food cycles are used to introduce the faunal section, and this leads logically enough to chapters headed 'Food Relationships', 'Competition and Feeding Adaptations', 'Protective Adaptations', 'Adaptations relating to Reproduction and Life History', 'Dispersal Adaptations' and 'Numbers of Animals'. Then follow several pages of excellent suggestions for further study that show careful consideration of the problem; but does Mr. Neal really believe that any useful work can be performed at this stage on 'variation in micro-fauna (*i.e.* Mites and Collembola) of leaf litter'? It seems to me that this suggestion is rather ambitious, since it would involve full-time research of great complexity—the taxonomy of mites alone requiring nearly a library to assist in their identification!

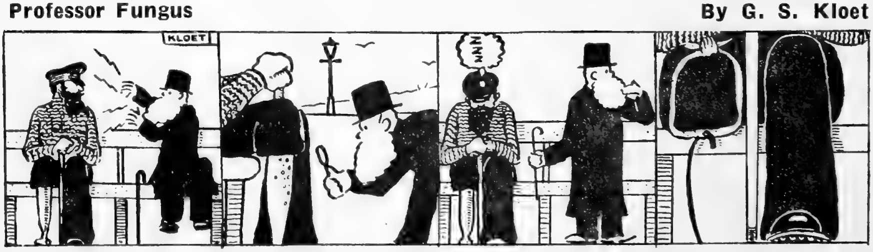
There are no references in the text to the figures, which, particularly in the case of the one on page 34 labelled 'Atomometer . . . .' should, I think, be annotated. This figure is particularly puzzling and the only help one gets is to turn to the original work! A type error on page 25 gives the rather novel spelling of 'ffowers' for 'flowers', and in the diagram on page 40, Gr. is used instead of Cr. which is in the key. A few statements are misleading or incorrect: the diagram on page 52 labelled 'Berlese Funnel' is actually the Tullgren Funnel (a modification of the Berlese—a 'true' Berlese having a water heating jacket and no light source). In chapter 10 (page 84) the author discusses mimetic types using 'pseudo-warning' colouration in the woodland, but he fails to emphasise that it is theoretically essential on the basis of orthodox Batesian Mimicry for the mimetic form to be less common than its model.

The statements on page 63, 'All these animals (referring to Mites and Collembola) feed on decaying plant matter', is incorrect, for many of the litter mites are predatory, and recent work has shown that some Collembola feed on fungi in the litter and not on the litter itself. The definition of a parasitoid given on page 66, 'a parasitoid lives in the larval stage on a host not much bigger than itself which it eventually destroys', is not strictly correct, for size is not a criterion of the parasitoid. Perhaps a better definition would be: 'a parasitoid lives in the larval state in a host which it eventually destroys'.

In a small book, with so wide a title, one is bound to disagree with some aspects emphasised and views expressed, but these criticisms should in no way be allowed to detract from the merits of this book. It should be read by all interested in Natural History. I found it excellent reading and I would strongly recommend it as an introduction to further study.

P. E. S. W.

Professor Fungus **By G. S. Kloet**



Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. 1954.

A Glossary for the Young Lepidopterist -	6d
Label List of British Macro-Lepidoptera -	3s 6d
Check List of British Macro-Lepidoptera -	1s 6d

(If purchased together 4s 3d)

AES Leaflets

No 1.	Collecting Coleoptera	3d
3.	Rearing Silkworms	3d
4.	Collecting Sawflies	6d
5.	Collecting Flies (Diptera)	2s 6d
6.	Collecting Beetles associated with Stored Food Products	1s 6d
7.	Some Improved Devices for Rearing Hymenoptera	6d
8.	Collecting Ants	6d
9.	Collecting Caddises	1s 0d
10.	Experiments with Bees	6d
11.	Collecting Mosquitoes	6d
12.	Collecting Dragonflies	6d
15.	Collecting Heteroptera	6d
16.	Making a Sweepnet	3d
17.	Making a Garden Pond for the Study of Aquatic Insects	6d
18.	Collecting Clearwings	6d
20.	Preserving Caterpillars	1s 0d
21.	Collecting Psocoptera	6d
22.	Collecting Lacewings	1s 0d
23.	Collecting Centipedes and Millipedes ...	6d
24.	Entomology of Bird Pellets	1s 6d
25.	Collecting Bumble Bees	2s 0d
26.	Collecting Collembola	1s 0d

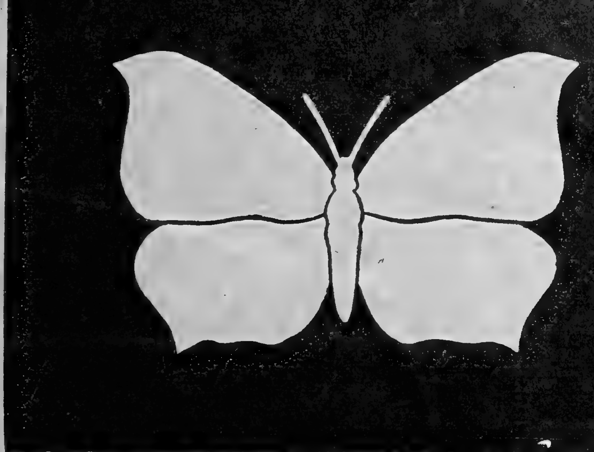
When 12 different leaflets are ordered a deduction of 10% from the total cost is allowed.

All these publications are obtainable from the Honorary Publications Secretary, C. BIGNELL PRATT, 1 WEST HAM LANE, LONDON, E.15. A remittance must accompany the order and sufficient to cover postage must be included. Postage on one leaflet is $1\frac{1}{2}$, on one volume 2d.

VOL. 13

No. 159

MARCH - 1954



THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

EDITED by B. R. STALLWOOD

AES BULLETIN

No. 159

MARCH 1954

WHY NOT COLLECT FLIES?

To most of us flies are a plaguey nuisance, fouling our food, biting our ankles, buzzing up and down the windows, and depositing on paintwork and linen an ineffaceable black spot. And what is more maddening than the cloud of tormentors that follows us with such relentless persistency, when we walk in the country on a summer day?

All this is most unscientific. As naturalists we have to think of them as Diptera—two winged—one of the Orders in the Class of arthropods known as Insecta. Reference to past issues seems to indicate that this is an Order much neglected by members of the AES. The extent of this neglect can be measured by examining the Index for 1952, where it will be found that 113 species of the Lepidoptera were referred to during the year, whereas only 25 of the Diptera were noticed in four mentions of varying length. In space $6\frac{1}{2}$ columns out of approximately 180 were occupied by this Order.

Why are the Flies so unpopular? To recite some of the possible reasons may be to produce a remedy:

1. The lack of an expert dipterist, with sufficient leisure, who could stimulate interest in them by contributing articles to the *Bulletin* at frequent or regular intervals. To this must be added the failure of members to pass on their knowledge, however limited it may be, by supplying the Editor with items of news from time to time.
2. The immensity of the task; over 5000 species is enough to daunt all but the most determined.
3. The idea there may be in many minds that they are dull and uninteresting.
4. The scarcity of textbooks and informative literature for the beginner.
5. The nomenclature.

What can be said to minimise these difficulties, and to encourage any would-be dipterist?

No. 1 requires no comment, the solution is self-evident.

2. Let no one be frightened by this figure of 5000, which includes a large number of small and very small Flies that only an expert can deal with and identify. The best course for the beginner is to leave all these to live out their little round undisturbed, and to concentrate on those that can be handled easily. This will keep the most industrious collector busy for a very long time. They will be found in plenty on Blackberry and Ivy blossoms; the flowering heads of umbelliferous wild plants; on trees, fences and the seashore; in ditches, reed beds and meadows, as well as in the most smelly and unsavoury places. The walls and windows of our homes will furnish an unexpected assortment of species. It will not be long before each typical venation comes to be recognised as a familiar landmark; from then on progress, although it may not be swift, should be steady.
3. To hold this view is a very great mistake; anyone who has seen even a modest collection of the Flies must have been amazed at the beauty displayed. The variety of venation, from the most complex to the uttermost simplicity, and the patterning of the wings—barred, dappled, mottled or clouded—are a source of continual wonder and delight.
4. This is a real difficulty. There is plenty of literature, but much of it is highly technical, and to be found only in the publications of various scientific societies. Textbooks for the beginner are few and expensive, and the best of them can give no more than a comparatively small number of sample illustrations. Identification keys are obtainable, but they are not easy to manage, and are of no use at all until the dipterological terms have been mastered.
5. Very few of the Flies have commonplace names; apart from Daddy-long-legs, Blue Bottle and perhaps half a dozen more, only scientific (Latin) names are at-

tached to every species. "Those who collect insects, and who do not wish to be utterly isolated, must learn to call them by names by which other people will know them". These words of H. T. Stainton written in 1857 remain true today. The difficulty of nomenclature, in so far as it is a difficulty, must be accepted as such. There is no easy way of overcoming it, patience and perseverance is the only answer.

Any member of the AES who, having read so far, decides to transfer his interest either partially or entirely to the Diptera, can be assured that once he embarks on this voyage of exploration, he will be led on from discovery to discovery, as he learns more and more of the lives and ways of these neglected but fascinating creatures. The very act of setting off in a fresh direction will be found to be both stimulating and refreshing.

H. B. SARGENT (1189).

SOME PROBLEMS ON PUPAE (1)

If you have ever tried to rear from the larvae such common autumn emerging moths as the Mottled Umber, Scarce Umber, Winter moths, etc., and early Spring ones such as Pale Brindled Beauty, March, Early, Spring Usher, etc., you will appreciate the implications of the heading to this article.

Probably in most cases, in view of the fact that the moths in question are common and can as a rule be readily obtained in good condition in the imago state, there is little point in rearing them from larvae. It so happens, however, that the females are wingless, and consequently come less under observation, thereby aggravating the difficulties of getting them represented in the collection; breeding is the best solution to obtaining as many females as you require, and here you will find yourself up against it in practice.

Generally speaking, larvae which pupate in the early summer, go down into the soil several inches, since by so doing, they are assured of the degree of humidity necessary to sustain them during the hot and dry summer months. It follows, therefore, that unless suitable conditions are provided in captivity approximating to those under natural circumstances, one's efforts, are largely doomed to disappointment.

The average type of breeding cage comprising a relatively shallow tray for pupation is in many cases a snare and a delusion; they are admittedly suitable for larvae collected in the early Spring, such as those of the Broad Bordered Yellow Underwing, Purple Clay, or Double Square-Spot, which readily pupate in a dry or dryish soil without imperilling emergence, but useless for larvae of the Brindled Beauty or Blossom Underwing.

Repeated failures to rear some of these so-called 'difficult' species galvanised me into evolving a method of circumventing the difficulties and finally achieving success; and I can only trust that the following notes will assist collectors in obviating headaches and disappointments previously encountered in breeding larvae.

Disliking elaboration in any form, (to suit me any device must be simple in construction, effective in results, and embrace a wide tolerance for neglect) I finally decided on the following make-up. Purchase from your ironmonger a feeding bucket; these are shallow buckets, 7″ deep and having a diameter of 14″. Next you will require a 13″ flower-pot, while to complete the outfit get a tinsmith to make a cylinder out of galvanised iron—6″ deep and 11″ diam.—with a groove pressed round about 1″ from a rim. This cylinder is subsequently 'sleeved' and the groove is to secure the bottom of the sleeve by housing the encircling string. To make the outfit operative, the pot requires to be filled to within about 2″ of the top with fine sandy soil, and the pot is then placed in the bucket; the cylinder is then worked down into the soil where it will soon impinge against the sloping sides of the pot. A bottle of water can now be sunk in the centre of the pot for foodplant purposes, and finally a loose fitting sleeve can be slipped over the cylinder, and the pot is now ready to receive the larvae.

The sleeve will obviously require some support, and various ideas commend themselves, such as bent canes, upright sticks, or pieces of strip metal such as are used for binding crates and made into inverted 'U's; but personally I favour a light framework made from four pieces of ¼″ birch dowelling, say 18″ long, drilled through near both top and bottom. Stout brass wire is then threaded through the holes, brought round into a circle, the ends soldered, and the dowelling arranged uniformly round the circle. Needless to say, the frame must be made of a diameter

to fit inside the cylinder, and once made it will last for years.

Up to this point the soil in the pot is dry, or presumably so, and not suitable for pupating larvae, and providing the larvae are nearing the full fed stage, it will now be necessary to ensure that the soil is not only dampened, but kept in that state. If the soil is bone dry pour half a gallon of water into the bucket. In two or three days it will have been absorbed by capillary attraction and a little distance from the surface the soil will now be found to be ideally damp; this state can be maintained by putting an odd pint or so of water into the bucket when the previous instalment has dried up, but care must be taken not to overdo the replenishments, and periodical checks on the humidity of the soil are desirable.

It is, of course, possible to rear larvae in this type of cage when very small, but in practice I rear them until nearly full grown in any of the simple box-type cages and then transfer them to the plant pot for final pupation, as this method reduces the accumulation of frass in the pot and the consequent frequency of cleaning. Larvae which have gone down can be left in perfect safety for months, provided the humidity is maintained, and can be dug up either in the autumn or early spring according to the expected time of emergence; alternatively they can be removed to the pupa box of a type I shall describe later on, when they have been in the pupa stage a few weeks, and free the pot for a further batch of temporary residents.

The digging up process will, doubtless, provide a few surprises, as I have recovered pupae of the Brindled Beauty (*Lycia hirtaria*) from a depth of eight inches. This goes to prove how futile it is to try and rear larvae like these in a shallow tray. You will also be gratified to notice the generally large size and healthy appearance of the pupae so bred.

(To be continued)

L. G. F. Waddington (169).

SOME INTRIGUING PROBLEMS (3)

Anyone who has worked with a Mercury Vapour Trap must have noticed repeatedly how different species respond to the light in different ways. As a general rule the strongest insects with more powerful flight enter the trap, while the insects with weaker flight tend to come to rest outside and around it. This is only to be expected, and it makes it much harder to form an opinion concerning the abundance of species belonging to the Geometridae, than to the Noctuidae. One has to be at the trap as soon as dawn appears, if one is not to miss large numbers of the Geometridae, which will have flown away to some place of seclusion before one sees them, if one leaves the trap until long after sunrise. But the really strange and interesting thing is, that species with roughly the same power of flight respond in such strikingly different ways. Take, for example, two autumn species of the Noctuidae, both of which come to the light with reasonable frequency. This autumn (1953) just short of two dozen specimens of *Brachionycha sphinx* Hufn. (the Sprawler) have come to the trap, but not one of them has entered it. Without exception they have been found in the morning on a wall within the influence of the light, or even on a window adjacent to the wall in one instance. On the contrary, *Agrochola macilenta* Hübn. (the Yellow-line Quaker) which has come to the light in rather larger numbers than *B. sphinx*, has almost invariably entered the trap. Out of just over three dozen specimens, the only ones found outside the trap have been three or four hiding under leaves within the light's influence. Other species are found inside and outside the trap in roughly equal numbers. Such, for instance, among species on the wing at the same time as the two already mentioned, are *Episema caeruleocephala* Linn. (the Figure of Eight) and *Allophyes oxyacanthae* Linn. (the Green-brindled Crescent).

Both these species come to the light in very considerable numbers, and are apparently equally likely to come to rest outside the trap as to enter it. I suspect that the interpretation of these facts would be a highly technical matter. I even doubt whether in our present state of knowledge an interpretation is possible. But it certainly has the practical implication that all who use light traps should look not only inside them but around them. I deliberately place my trap so that it shines brightly on a wall, and on the windows of a small conservatory. Actually, in doubtful or wet weather I have the trap inside the conservatory, and it still shines through the windows on to the wall outside. I have learnt this method by experience and by observing the different reactions of different species. That they do react differently is an obvious

fact: why they do I cannot say—though I should be most interested to see any suggestions as to why it might be. Anyhow, if I did not carefully examine everything which comes within a reasonably close range of the light I shouldn't know that *B. sphinx*—and other species not mentioned here as well—occurred in this neighbourhood at all.

J. H. Vine Hall (1520).

COLLECTING DUNG BEETLES (2)

The genus *Aphodius* is one of the largest of the genera which comprise the extensive family Scarabaeidae. Approximately 1000 species, varying from 2 to 15 mm. in length, have been described to date, and they are widely distributed in almost every part of the world.

The most recent monograph covering the genus from a world-wide aspect, is that of Schmidt[1] (1922) in which 686 species and their varieties are fully dealt with, and Paulian[2] (1941) has provided keys and descriptions of the 89 species recorded from France, together with figures of the male genitalia.

A recent list (1953) received from the United States records 187 species as found in North America and it is interesting to note that a number of these have been introduced from Europe. The key work for the North American species is Horn[3] (1887). Peringuey[4] (1901) has described 63 species from Southern Africa, but hardly any work has been done on the genus in that country since, and this number could probably be trebled.

The genus has been sub-divided into 74 sub-genera, although recent American authors such as Cartwright[5] and Robinson have tended to ignore the sub-generic divisions in their descriptions of new species. According to Kloet and Hincks[6] (1945) the British list contains 41 species, but there has been no revision work done on the group in this country, and the earlier authors vary in the number of species acceptable as indigenous: Fowler[7] (1890), and Hudson Beare[8] (1930) quote 41, and Joy[9] (1932) quotes 39.

The distribution of *Aphodius* species in the British Isles has not been investigated in detail, and little is known concerning the immature stages and life histories. They are to be found in dung of all kinds more or less throughout the years but individual species vary enormously in their times of appearance. For example the well known *A. fimetarius* Linn. can be found in dung from March until October, whereas *A. contaminatus* Herbst does not appear at all until late August.

At least one species (*A. rufipes* Linn.) is a regular visitor to the lepidopterist's light traps and more records of this native would be of great interest*. So far, my experience in Britain leads me to doubt whether any species are exclusive to one type of dung; altitude above sea level, and type of sub-soil seem to be important factors.

It is said that two species found scarcely in this country (in the sub-genus *Nialus*) are not dung feeders at all, but the evidence is not very conclusive, and rabbit dung is usually present in the few known localities where they have been found.

A species of *Aphodius* has been reported from Australia as causing serious damage to golf course greens (in the larval stage), and some recently described species from Texas and Florida have been found only in the burrows of gophers (*Geomys*).

L. S. Whicher (1345).

References

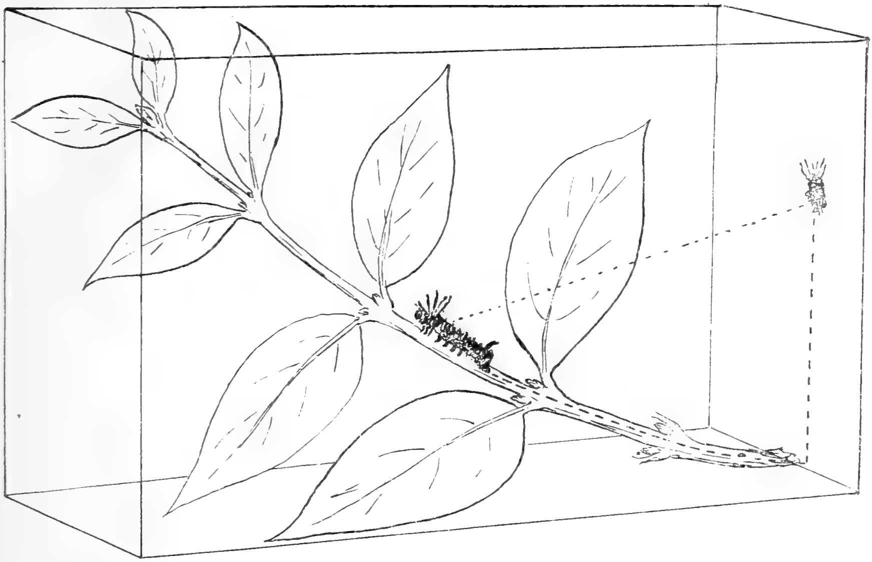
1. Schmidt, A. (1922) *Das Tierreich* Vol. 45, *Aphodiinae*.
2. Paulian, R. (1941) *Faune de France* Vol. 38, *Coléoptères Scarabéides*.
3. Horn, G. (1887) *Trans. Amer. Ent. Soc* Vol. 14.
4. Peringuey, L. (1901) *Trans. S. African Phil. Soc.* Vol. 12.
5. Cartwright, O. L. (1944) *Ent. News*. Vol. 55 : 5.
6. Kloet, G. S., and Hincks, W. D. (1945) *A Check-List of British Insects*.
7. Fowler, W. W. (1890) *The Coleoptera of the British Isles*, Vol. 4.
8. Hudson Beare, T. (1930) *A Catalogue of the Coleoptera of the British Isles*.
9. Joy, N. H. (1932) *A Practical Handbook of British Beetles*, Vols. 1 and 2.

HOW WAS IT DONE?

I have just witnessed an example of a caterpillar finding its way back to a desired spot by the most direct route possible, without there being any apparent means of back-tracking, and it is possible that other members may like to hear the story:—

I am attempting to rear larvae of *Citheronia brisotti* (Ceratocampidae) in a plastic container. One misguided individual decided to position itself on the side of the container for its second moult. Naturally I made

*[A reference to *Aphodius rufipes* at light will be found in *Bull.* **12**, 95 (Dec. 1953).—Ed.]



no attempt to move it and for two days it remained comatose. On the third day it moulted, and when I went to clean and feed the brood, it had crawled about half an inch from its old skin. There seemed to be no harm in moving it on to fresh food while the container was cleaned, so I placed it on a fresh spray of privet and laid it on the table. Later it was placed in the container with the other larvae. I do not know what interval there was between the time it shed its skin and the time I moved it, but it was sufficient for the long spines (it is one of the 'Horned Devils') to become rigid. It was not until I closed the cage that I noticed that the old skin still remained on the side. Had I removed it these notes would never have been written.

The relative positions of the larva and the old skin were as shown in the figure.

For about half an hour the caterpillar did not move, not that I was watching it all that time; but it was about half an hour later that I looked at the cage and saw it begin to move.

The grotesque figure interested me so I continued to watch. Much to my annoyance it turned completely round, and made its way down the stem ignoring the leaves. On reaching the bottom corner it continued up the side of the container without the slightest hesitation, crawling at a fairly rapid rate, straight to its old skin. There it stopped, and after a pause of barely a couple of seconds commenced to consume its old skin—spines and all. Having finished its meal, it retraced its steps and resumed approximately the same position on the spray on which I had placed it. The whole operation seemed to me to be too deliberate to be accidental. How was it done?

The possibility of back-tracking its own scent down the stem must be ruled out, for it had no previous contact with the stem in question. Likewise must we rule out the silken thread theory, as the caterpillar had been placed on fresh food on the table, and outside the cage. The cage itself had then been wiped out and carried outside to empty away the frass—a distance of about eight yards, sixteen yards in all, from where the larva lay.

Assuming that a silken thread could have been drawn from the body, it must have been valueless as a guide by the time the spray was placed in the container and the lid closed. Again it is known that the visual range of caterpillars is very small indeed, and would certainly not cover the three and a half inches which separated the larva from its skin (straight line distance). Furthermore at no time did I see it peering about as if trying to locate the skin. Though unable to travel in a straight line through space, it took the shortest route, accomplishing the journey as though it knew before it started exactly where it wanted to go. Unless therefore we try and introduce a theory of transmission and reception of some mysterious ray,

it appears that the only remaining explanation is the possession of a very highly developed sense of smell. Perhaps it might be more accurate to say that it confirms our belief that they have remarkable powers of scent. The return journey could, of course, be explained by either method.

W. R. Smith (1641).

INSECTS IN A COAL-MINE

Further to my previous article on insects found in a Derbyshire coal-mine in 1952 (*Bulletin* **12**: 35), the following is a list of moths taken during 1953, with dates of capture and numbers caught:—

Smerinthus ocellatus Eyed Hawk 29.6. 1
Deilephila elpenor Elephant Hawk 29.6. 1
Lophopteryx capucina Coxcomb Prominent 7.7. 1
Arctia caja Garden Tiger 15.7.—15.8. 9
Cycnia mendica Muslin Ermine 6.6. 1
Spilosoma lubricipeda White Ermine 24.6—6.7. 10
Euproctis chrysorrhoea Yellow Tail 17.7—12.8. 3
Cilix glaucata Chinese Character 19.8. 1
Agrotis exclamationis Heart & Dart 11.7. 1
Anchoscelis litura Brownspot Pinion 15.9. 1
Amphipyra tragopogonis Mouse 17.9. 1
Agrochola lychnidis Beaded Chestnut 7-14.10. 3
Leucania lithargyria Clay Wainscot 10-11.7. 2
Leucania pallens Common Wainscot 11-22.7. 2
Procus strigilis Marbled Minor 20.6. 1
Diataraxia oleracea Bright Line Brown Eye 11.7-15.9. 2
Amathes c-nigrum Setaceous Hebrew Character 16.9-17.10. 3
Plusia iota Plain Golden Y 23.6-17.7. 2
Euplexia lucipara Small Angleshades 3.9—17.10. 3
Plusia gamma Silver Y 17.9—15.10 11
Orthosia gothica Hebrew Character 23.4. 1
Triphaena pronuba Large Yellow Underwing 19.8. 1
Xylophasia monoglypha Dark Arches 17.7-19.8. 8
Crocallis elinguaria Scalloped Oak Thorn 10-13.8. 2
Dysstroma truncata Common Marbled Carpet 18-23.9. 2
Eupithecia vulgata Common Pug 29.6. 1
Eupithecia centaureata Limespeck Pug 6.8. 2
Deuteronomus fuscantaria Dusky Thorn 31.8—21.9. 3
Erannis progemmaria Dotted Border 26.2. 1
Colotois pennaria Feathered Thorn 11.10. 1
Ourapteryx sambucaria Swallowtailed 16-26.7. 2
Oporinia dilutata November Carpet 15-25.10. 2
Phigalia pedaria Pale Brindled Beauty 25.2—2.3. 2
Selenia bilunaria Early Thorn 23.4. 1
Alucita pentadactyla White Plume 6.6. 2

All the above insects were caught within 30 yards of the shaft bottom, and the time of capture between 10.30 p.m. and midnight. I was amazed at the number of *D. fuscantaria* (Dusky Thorn) that had been killed and trodden on by workmen travelling the pit bottom roadways.

Tinaea pallescentella can still be found in good numbers. The air-tubes that I mentioned in my previous article have now been taken out, causing the moths to go to another old roadway junction where there is more room to study them. On 17.6.53 I went to this junction at 6.0 a.m. and picked up 60 dead moths; every one was perfect, but all had been dead for a day or two. At the same time there were 40-50 on the wing, flying about a yard and then settling on the dust.

I wondered at the time if all the dead moths were from one batch of eggs which had gone through their life-cycle together, and had just simply died within a few hours of each other.

I sent some of these micros to several members of the AES for breeding, or rearing some moths from eggs, but I have not heard if they have been lucky enough to rear any. My own experience with the moths and breeding was unlucky; I put a piece of old crumpled tissue paper in a glass jar, together with a dozen of the freshly-caught micros, and they got into the folds and cracks of the paper. I also put a pinch of fishmeal and dirt into the jar, hoping that should any larvae appear they might feed on this diet. Three days after, I noticed about six dirty white eggs in the bottom of the jar which were covered with a fine web with a light sprinkling of dust on it. After a week the eggs could not be seen, for more dust and dirt covered them completely, and by this time the moths were dying off. Another week passed without sign of any larvae. I watched the jar for a month, still no signs, so I decided the eggs were not fertile.

A fortnight later I emptied the jar, depositing the fishmeal on to the lawn, then turned my attention to the crumpled-up paper. When I straightened out the paper I found it riddled with holes about pinhead

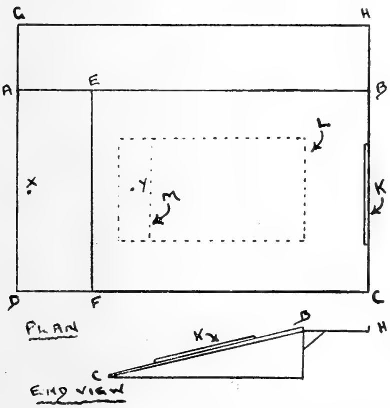
size. At once I searched for pupae, or larvae, but found nothing. I then thought of the fishmeal, but too late, I had emptied it away. It could have contained pupae I was searching for. The paper furnished proof that larvae had been feeding on it.

W. Bilbie (1679).

PRACTICAL HINTS

A SETTING DESK

This aid to setting holds the board firmly at a convenient angle. It was designed for use with 7″ boards, but is equally effective with 14″ if work is started from the middle of the board. (See figure.)



Operation—The panel EBCF is moved to the right by gripping the beading K, the board is inserted in the gap so made, at EF, and the hidden spring connecting X and Y exerts sufficient pressure to hold it in place. The projecting shelf AGHB can be covered with cork or baize, and on it placed pins, setting needles, etc.

Construction—Materials depend on the ability of the constructor and what he has available; ¼″ 3-ply and ¼″ round (quadrant) beading are suitable. First cut 2 similar triangular end-pieces 8″ × 2″ (the hypotenuse should be 8″ and the other side will then be a little less). Rectangle ABCD is 8″ × 14″ and has a hole cut in it 4″ × 8″ (indicated by dotted line L). Fix end-pieces to this at AD and BC, then cut another piece of 3-ply 8″ × 3″ and secure it with glue at AEFD. Now cut EBCF, 8″ × 11″, and glue to it a piece of beading at K, to act as a grip. On the under-side of this panel fix a small piece of ply-wood 2½″ × 4″ as indicated by M; this should be a good fit but slide freely in L. A strip of wood or tin nailed on top of M, 1″ × 5″, will prevent EBCF from coming adrift, but see that it slides nicely from left to right and butts squarely on to the fixed piece AEFD. Screws or hooks underneath at X and Y hold the ends of a spring or strong elastic cord which must be capable of stretching 4½″ without too much strain. The distance XY must be such that the spring exerts sufficient pull to hold the smallest setting board to be used, and the spring must extend enough to accommodate the largest. The shelf AGHB may be about 2½″ × 14″ and should be fitted so that it is horizontal, and its edge flush with the fixed panel ABCD; a setting board can then project over it if so desired. The angles between the end-pieces and the fixed panel should be strengthened by glueing in pieces of ¼″ round beading. A stiffener along underneath AB is also necessary.

For work with micros a lens is most useful. It should be mounted somewhere about A and be capable of being swung over the board when required.

John E. Knight (94).

LETTER TO THE EDITOR

Dear Sir

Would you be good enough to invite the interest of the members of the Amateur Entomologists' Society in records which are being compiled at Juniper Hall of plant and animal species occurring in central Surrey, especially the areas of Box Hill, Leith Hill, and the heathlands of West Surrey. It is possible that some of your members might be able to augment our records by making available their own lists of species of insects, etc., together with notes about occurrence, distribution or other points of ecological interest. It is hoped that our records will in turn be of use to specialists in various fields. I need hardly add that we are very careful about disclosing information as to the occurrence and precise locality of rare species known to us, and would treat with confidence any information of this kind which other workers may care to give.

Yours sincerely,

J. H. P. Sankey,
Assistant Warden,
Council for the
Promotion of
Field Studies.

Juniper Hall,
Dorking, Surrey.

BUTTERFLIES IN 1953

Mr. H. F. Tebbs (1897) reports:—

In the Peterborough district I doubt whether butterflies as a whole were really scarce, but the sunless days have meant a number of poor days recorded in my diary. Common Blues (*Polyommatus icarus*) were uncommon until autumn, when Small Tortoiseshells (*Aglais urticae*) were also very common, and Commas (*Polygonia c-album*) were seen more than for several years. I did not see a Painted Lady (*Vanessa cardui*).

Hairstreak larvae were to be found in most of the places in which one would expect them, and the Purple Hairstreak (*Thecla quercus*) could be beaten from almost any oak tree in the neighbourhood.

Lt.-Col. A. E. B. Wood (1675) writes:—

During the whole year I saw only two *Vanessa cardui*, one in a clover field near the Teign Estuary and the other in the garden at Bishopsteignton. Both were very perfect specimens and seen during October. Only four or five *Colias croceus* were noted instead of the usual two or three dozen.

Celastrina argiolus and *Aricia agestis* were in fewer numbers than usual, *Polyommatus icarus* and *Polygonia c-album* both fairly common, and *Pararge aegeria* and *Aglais urticae* abundant.

I have never seen so many *Nymphalis io*; in a field I observed eight sitting on a large flat stone, but *Aphantopus hyperantus* was relatively scarce.

In July 1952 I visited Stover Park near Newton Abbot, where I found *Agapetes galathea* in abundance. This year there were none! The Jersey Tiger moth, *Euplagia quadripunctaria*, now almost limited to this locality I believe, was fairly common.

From Mr. W. H. H. Morris (2025):—

In Wolverhampton this season I found that, on the whole, butterflies in many cases have been scarce.

Pieris brassicae (Large White) was flying on April 23rd but was not plentiful during the spring. *Euchloë cardamines* (Orange-tip) which was flying in good numbers this year was first seen April 25th. Of these I obtained ova on May 18th which duly pupated June 10th. *Pyrgus malvae* (Grizzled Skipper) which was not in such great numbers this season was first observed April 24th.

It has been an excellent season for *Aglais urticae* (Small Tortoiseshell). My first nest of larvae was found May 3rd and my last imago emerged October 10th. *Pieris napi* (Green veined White) was far from plentiful, *Vanessa atalanta* (Red Admiral) very scarce, and I did not see a single *Vanessa cardui* (Painted Lady).

[*Aglais urticae* was abundant in Surrey this past summer, and a nest of larvae was seen feeding at Claygate as late as Oct. 13th, 1953.—Ed.]

BOOK REVIEW

Handbooks for the Identification of British Insects. Vol. X, Part 1. Diptera, Syrphidae. By R. L. Coe. Royal Entomological Society of London. August 1953. Pp. 98. Price 17/6.

This very welcome book provides Dipterists with the first complete key to the Syrphidae of the British Isles for over 50 years.

The introductory chapter gives the characteristics of the family, general life histories and habits of the species, and includes short notes on collecting and mounting. The 234 known species of Syrphidae, and 13 named varieties, are covered by the keys and illustrated by line drawings, which, in some cases, could have been smaller in size and more in number, thereby adding to the usefulness of the necessarily short descriptions. The well established names of Verrall are used, with synonyms in brackets. A Check list would have added to the usefulness of the handbook without adding greatly to its size. The book concludes with a bibliography.

Those of the keys which have been tried seem to be entirely satisfactory, but for the identification of some species, the descriptions in Lundbeck or Verrall need to be consulted. Following the interest aroused in Diptera by Colyer and Hammond's "British Flies," this book should further stimulate interest in this conspicuous family, which still has a great number of gaps in the life histories and distribution to be filled.

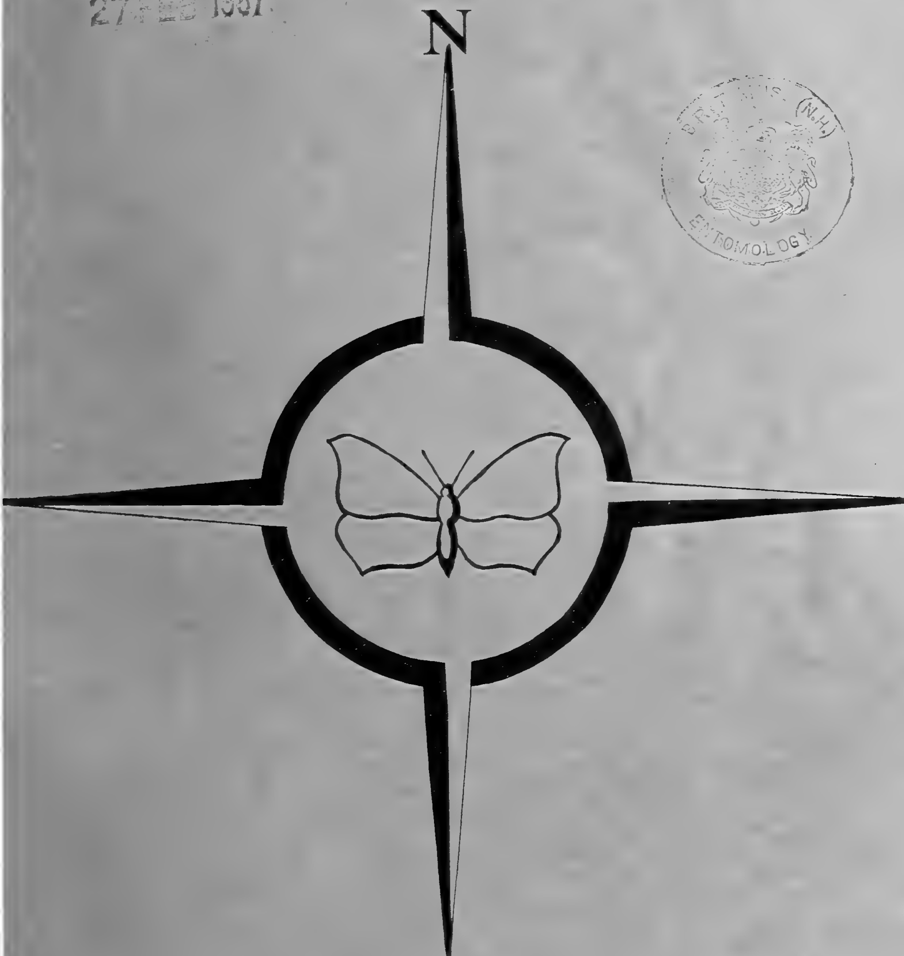
K. H. B.

Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. 1954.

VOL. 13
No. 160

THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

APRIL
1954



Membership List and Geographical Key

Compiled and Edited by **B. L. J. BYERLEY, F.R.E.S.**

AES BULLETIN No. 160 APRIL 1954

MEMBERSHIP LIST

Members are requested to notify B. L. J. Byerley, 48 Elmgrove Road, Harrow, Middx., of changes of address and biological interests. Please add your membership number to all AES correspondence.

Abbreviations

*=Junior Member
†=Affiliate Member
‡=Honorary Member
agric.=agricultural
aq.=aquatic
B.=biology
Bot.=botany
C.=Coleoptera (beetles)
Con.=conchology
D.=Diptera (flies)
Der.=Dermaptera (earwigs)
E.=ecology
econ.=economic
ent.=entomology
esp.=especially
exot.=exotic
fw.=fresh water
gen.=general
Geo.=geology
H.=Hymenoptera (ants, bees, wasps, sawflies, parasites)
Hem.=Hemiptera (bugs)
Het.=Heteroptera (het-bugs)
Hom.=Homoptera (hom-bugs)
L.=Macrolepidoptera (moths and butterflies)
M.=migration
mic.=microscopy
ML.=Microlepidoptera
N.=Neuroptera (mealy wings, lacewings)
NH.=natural history
O.=Odonata (dragonflies)
ornith.=ornithology
Orth.=Orthoptera (roaches, grasshoppers, crickets)
P.=Photography
R.=Rhopalocera (butterflies)
T.=Trichoptera (caddis flies)
Z.=zoology

The highest number in this memmembership list is No. 2321.

Adams, Mrs. J. M. (508), 43 Merchland Rd., London, S.E.9. (B.)
Addison, Rev. W. R. F. (230), Coltishall Rectory, nr. Norwich, Norfolk. (L.)
Ainsworth, Miss J. M. (1617*), Poplar House, 14 Monmouth St., Topsham, Devon. (L.)
Aldridge, R. V. (262), Rio, Berkeley Ave., Chesham, Bucks. (L.)
Allan, D. G. (1804), Dale View, Myrtle Terrace, Dalton in Furness, Lancs. (C.)
Allen, Miss D. M. (2081), Furzedown College, Welham Rd., S.W.17.
Allen, Rev. P. V. M. (1130), All Souls' School, Charters Towers, N. Queensland, Australia. (L.)
Allen, S. E., F.Z.S. (2001), 20 Friar's Garth, Abbey Town, Cumberland. (C.)
American Museum of Nat. History, The (1300†), Central Park West, at 79th Street, New York, N.Y., U.S.A. Com. to Miss H. Gay. (gen. ent.)
Anderson, G. D. (1933*), 75 Copgrove Rd., Leeds, 8. (C.)
Appleton, A. H. (1612), " Spinney Hollow," Disley, nr. Stockport, Cheshire. (H., L.)
Archer, M. E. (1906), 4 School Terrace, Tone, Wellington, Somerset. (O., H.)
Ashby, G. J. (2252), Insect House, Zoological Gdns., Regent's Park, London, N.W.8.
Ashcroft, J. (2258), Trentham, St. Nicholas Rd., Witham, Essex. (gen. ent.)
Ashe, G. H. (1532), Gribblemead, Colyton, Devon. (C.)
Ashmore, J. S. D. (826), Ward's End Farm, Adlington, Macclesfield, Ches. (L., C.)
Ashwell, D. A. (223), 34 North St., Bishops Stortford, Herts. (L., O., P.)
Atherton, A. (2281), 64 Moorside Rd., Davyhulme, Manchester. (gen. ent.)
Atkinson, R. S., F.R.A.S. (1336), 46 White Hill Ave., Barnsley, Yorks. (N.H., gen. ent.)
Aubé, J. C. (2159), 91 des Franciscains, Quebec, P.Q., Canada.
Austin, C. (1571), 156 Hamilton Ave., Tolworth, Surbiton, Surrey. (L.)
Austin, N. J. (966), Chapel House, High St., Thorpe - le - Soken, Essex. (L., C., H., Hem., O., ornith., Geo., Con.)
Australian Branch A.E.S., Box 1176, G.P.O., Sydney, N.S.W., Australia.

Backley, W. A. (2300*), 6 Irwin Ave., Wallsend-on-Tyne, Northumberland. (D., C.)
Backwell, C. J. (2220*), 17 Church Lane, Whitchurch, nr. Bristol. (gen. ent., L.)
Backwell, L. (2070), 17 Church Lane, Whitchurch, nr. Bristol. (L.)
Bacon, A. (2232), 9 St. Mary's Crescent, Portsmouth, Hants. (H.)
Bailey, N. M. (1230), Hill Crest, Ash Grove, Limefield, Bury, Lancs. (L., gen. ent., Bot., ornith.)
Bailey, P. R. (1824), "Glendale", Scotby, Cumberland. (gen. ent.)
Baker, C. R. B. (1533), The Vicarage, Seend, Melksham, Wilts. (gen. ent., P., mic.)
Baker, Dr. F. H. Uther (2011), 205 Canning Rd., E. Fremantle, Western Australia. (C.)
Baker, N. B. (2264*), 5 Hanger Court, London, W.5. (C.)
Balfour - Browne, Prof. F., F.R.S.E. (340‡), Brocklehirst, Collin, Dumfries. (gen. ent., aq. C.)
Ball, D. J. (1864), 51 Clifton Rd., Weston - super - Mare, Somerset. (gen. ent.)
Banner, Dr. J. V. (103), 41 Varden Gdns., Brighton 6, Sussex. (L.)
Banthorpe, M. J. (2180*), 90 Gurney Court Rd., St. Albans, Herts. (L., gen. ent.)
Barbrook, G. M. (1164), 23 Eric St., Oldham, Lancs. (gen. ent. esp. L., aq. ent.)
Barham, M. J. D. (459), 17 St. Martin's Grove, Leeds 7, Yorks. (L.)
Barker, A. J. G. (2158*), 8 Carden Ave., Brighton, 6, Sussex. (L.)
Barker, M. J. W. (1606), "Perrylyn", Darras Rd., Pontelands, Northumberland. (L.)
Barling, J. S. (1940), 149 Union St., Dunstable, Beds. (aq. ent., Ants)
Barnard, P. (761), 12 St. Leonard's Ave., Windsor, Berks. (L., mic.)
Barnett, T. L. (281), 31 Littleheath Rd., Selsdon, Surrey. (L.)
Barrett, K. E. J. (1990), 79 Southfield Rd., Oxford. (H. esp. Formicidae)
Bartle, Miss M. M. (1855), Withybush, Manley Rd., Ben Rhydding, Ilkley, Yorkshire. (gen. ent.)
Barton, R. E. C. (1502*), "Renfreys", West Clandon, nr. Guildford, Surrey. (L.)
Bartrop, T. H. C. (1858), Oak Tree Cottage, Margaretting, Ingatestone, Essex. (gen. ent.)
Baxter, L. N. (1664), 16 Bective Rd., Forest Gate, London E.7. (gen. ent. esp. L.)
Baxter, R. (1267), 16 Bective Rd., Forest Gate, London E.7. (L.)
Baynes, E. S. A., F.R.E.S. (1221), 2 Ashendale Rd., Glenageary, Co. Dublin, Eire. (L., gen. ent.)
Bazin, M. J. (2298*), 9 Woodford Rd., London, E.11. (L.)
Beattie, I. S. (142), 10 St. Catherine's Place, Edinburgh, 9. (L.)
Beaufoy, L. S., M.A. (628), 54 Bower Mount Rd., Maidstone, Kent. (breeding L., NH.)
Beaufoy, S., B.Sc., A.M.I.E.E., F.R.P.S. (627), 98 Tuddenham Rd., Ipswich, Suffolk. (L.)
Bedding, D. G. S. (2210), 10 Carshalton Rd., Mitcham Common, Surrey. (Comparative morphology and evolution)
Bell, Dr. Fairfax (872), c/o D.M.S., Nairobi, Kenya. (R.)
Benfield, R. (2205*), 32 St. Mary's Square, Gloucester. (L.)
Bennett, Lt. (A) C. D., R.N. (1484), c/o 41 Commercial St., Senghenydd, nr. Caerphilly, Glam. (gen. ent.)
Bennett, M. J. (830), Leechwell Cottage, Totnes, Devon. (L.)
Bennett, R. C. (2095*), Wayside, Hosey Hill, Westerham, Kent. (gen. ent.)
Bennett, W. Chaplin (544), 37 Fore St., Totnes, Devon. (L., NH., ornith.)
Benson, R. H. (1444), "Denehurst", Jesmond Park East, Newcastle-on-Tyne 7. (L.)
Berry, J. E. (1072), School House, Grange-over-Sands, Lancs. (H. Aculeata, Pollen)
Best, A. A. (1202), 131 Woodham Lane, New Haw, Weybridge, Surrey. (L.)
Betchley, R. J. R. (2288*), Lucknow, Dellsome Lane, Welham Green, Hatfield, Herts. (Silkmoths)
Bickerstaff, F., F.R.E.S. (2078), 50 Broomfield Ave., Peacehaven, Newhaven, Sussex. (L.)
Bilbie, W. (1679), 33 John St., Clay Cross, nr. Chesterfield, Derbyshire. (L.)
Billington, B. J. (1969*), 35 Lynwood Ave., Slough, Bucks. (gen. ent.)
Bilton, E. (2073), 81 Abbey St., Holderness Rd., Hull, Yorks. (C.)
Bing, R. C. (1171), The Rose and Crown Hotel, Tonbridge, Kent. (L., mic.)
Bingham, C. D. (1506), 4 College House, Culham College, Abingdon, Berks.
Bird, P. F. (896), The City Museum, Queen's Rd., Bristol. (L., O., H. Parasitica)
Blackburn, A. (1715), 16 Rosebury Vale, Ruislip, Middx. (L., C.)

Blackwell, B. W. (1720), 6 Bulan Place, Headington, Oxford. (C., H., L., ornith.)
Blake, Mrs. M. A. (1451), 20 Crown Lane Gdns., London S.W.16. (Silkmoths)
Blake, R. R. (1745), The Flushings, Springfield Rd., Crawley, Sussex. (C., H.)
Blake, T. G. (1376), 20 Crown Lane Gdns., London S.W.16. (L.)
Bland, R. C. (2197), 7 Stanmore Rd., Watford, Herts. (L.)
Blathwayt, C. S. H., M.A. (651), 27 South Rd., Weston-super-Mare, Somerset. (L.)
Bliss, A. (287), Golden Mist, Whitford, Axminster, Devon. (L.)
Bobe, K. H. (912), 19 Hengist Rd., London S.E.12. (L., D.)
Boettcher, R. A. (2110), 1517 Buchanan St. N.W., Washington, 11, D.C., U.S.A. (D. esp. Syrphidae, Asilidae, Stratiomyidae, H., C. esp. Carabidae)
Bonar, A. J. (2297*), The Larches, Oaklands Rise, Welwyn, Herts. (L.)
Booker, W. G. C. (1742), 6 Southdown Rd., Carshalton, Surrey. (H., L.)
Bootham School Natural History Club (1027†), Bootham School, York.
Boxall, H. (1714), Yewtree Cottage, Iden Green, Benenden, nr. Cranbrook, Kent. (ML., O., aq. life, gen. ent.)
Boyce, H. L. G. (2251), 129 Nicolson Rd., Durban, Natal, S. Africa. (C.)
Boyes, J. D. C., B.Sc., A.R.I.C., F.R.P.S. (850), "Wimborne", Millfields, Nantwich, Cheshire. (L. esp. vars. and hybrids)
Bradley, A. (219), Four Elms, Granary Lane, Budleigh Salterton, Devon. (L.)
Bradley, P. Layfield (1360), 69 Manor Rd., Barnet, Herts. (L., H.)
Brangham, A. Norman (18), 9 St. Alban's Grove, London W.8. (Ants)
Bridgen, A. L. (2090), 13 Dallas Rd., Erdington, Birmingham, 23. (mic., D.)
Briggs, J. (832), 15 Frimley Drive, Little Horton, Bradford, Yorks. (L., C.)
Britten, H. (2186), 21 Tollers Lane, Old Coulsdon, Surrey. (D. esp. Trypetidae)
Britton, E. B. (232), Dept. of Entomology, British Museum (Nat. Hist.), Cromwell Rd., London S.W.7. (C.)
Brookman, M. (2287*), 62 Southend Rd., Weston-super-Mare, Som. (L.)
Broome, R. R., F.L.S., F.R.E.S. (653), 47 Keswick Rd., Boscombe, Bournemouth, Hants. (aq. ent. Bot., Salmon and Trout Fisheries)
Broughton, W. B. (1632), Laboratoire de Physiologie Acoustique, Domaine de Vilvert, Jouy-en-Josas. (SO), France. (Ephemeroptera)
Brown, L. S. (2062), Tasli, Hawks Hill, Leatherhead, Surrey. (L., genetics)
Brown, P. C. (1931*), 5 Denmark St., Colchester, Essex. (C.)
Brown, R. M. (1573), 6 Lake View, Carburton, nr. Worksop, Notts. (gen. ent., esp. H.)
Brunsdon, J. R. (759), Homecot, Bere Lane, Glastonbury, Som. (L. esp. breeding)
Bryce, D. (2067), The Bungalow, Cliffe Lane, Great Harwood, nr. Blackburn, Lancs.
Buckler, H. A. (334), Sutton Bassett, Market Harborough, Leics. (L., ML.)
Buckley, A. H. (2124*), New Lane, Skelmanthorpe, nr. Huddersfield, Yorks.
Bull, Dr. G. V. (160), White Gables, Sandhurst, Kent. (L.)
Bureau of Animal Population, The Library of (2163†), Botanic Gardens, High St., Oxford. (gen ent.)
Burrows, D. N. (1517), 76 Woodside Court Rd., Addiscombe, E. Croydon. (L.)
Burton, J. S. (798), 36 Regent Rd., Surbiton, Surrey. (gen. ent., esp. L.)
Burton, P. J. (1199), Paysanne, Goldshillwood, nr. Fordingbridge, Hants. (L.)
Burton, W. V. (179), 55 Whirlowdale Rd., Sheffield, 7, Yorks. (L.)
Burtt, E. T. (1756), King's College, Newcastle-on-Tyne. (D., gen. ent.)
Bushby, L. C. (1075), Curator of Insects, Zoological Society of London, London N.W.8. (gen. ent.)
Butler, R. (2214*), Southern Pine, N.C., U.S.A. (R.)
Byerley, B. L. J., F.R.E.S. (788), 48 Elmgrove Rd., Harrow, Middx. (D., gen. ent.)
Cable, R. A. (2188*), 59 Tenterfield Rd., Maldon, Essex. (L., O.)
Calvert, V. (2045*), 94 Bolckow St., Guisborough, N. Yorks. (L.)
Cameron, I. A. (2225*), 10 Princes Court, Worsley Rd., London, N.W.3. (C., Hem.)

Campbell, R. D. (2273*), c/o Berry Campbell, Dept. of Anatomy, University College, London, W.C.1. (NH.)
Capener, A. L. (6), St. George's Home for Boys, P.O. Box 4, Cleveland, Johannesburg, S. Africa. (Membracidae)
Capers, H. (2296), 19 Dewsbury Grove, Perry Barr, Birmingham, 22B. (L.)
Cardy, D. J. (2256*), Trees, Spring Lane, Hatfield Peverel, nr. Chelmsford, Essex. (C., Hem., N.)
Carlton Park Secondary Modern Boys School (1523†), Russell Town Ave., Bristol 5. Com. to R. C. Shearn.
Carr, R. W. D. (1175), Hillcrest, Totteridge Lane, London, N.20.
Carter, J. R. (2235*), 16 Grange Park Rd., London, E.10. (L., T.)
Carter, R. (2276), 25 Myatt Rd., London, S.W.9. (R., C.)
Cave, R. G. (1338), 16 Round St., Rugby, Warwickshire. (L.)
Chandless, R. C. (2213*), Sherrington Manor, Selmeston, nr. Polegate, Sussex. (L., H.)
Chapman, D. I. (1648), 38 Horn Lane, Woodford Green, Essex. (L.)
Chatfield, B. G. (1704), 1 Sydney Terrace, Station Rd., Hawkhurst, Kent. (L., gen. ent., NH.)
Chilton, E. T. (2245), 19 Wolverson Rd., Walsall Wood, nr. Walsall, Staffs. (L.)
Chipperfield, H. E. (64), 27 Chilton Ave., Stowmarket, Suffolk. (L.)
Chitty, F. J. (2083), Mereworth, Parkwood Rd., The Ridge, Hastings, Sussex. (L.)
Christie, L. (710), Station House, London Rd., Hackbridge, Wallington, Surrey. (L.)
Churchill, P. J. (2221*), 17 Boscombe Rd., Worcester Park, Surrey. (L.)
Claridge, M. F. (1420), 117-121 Railway Terrace, Rugby, Warwickshire. (L.)
Clark, A. B. (1495), 87 Vicarage Rd., Watford, Herts. (L., gen. ent.)
Clark, T. J. (1970*), 87 Upper Bristol Rd., Milton, Weston-super-Mare, Som.
Clarke, C. A. (1569), High Close, Thorsway, Caldy, Wirral, Cheshire. (L.)
Clarke, H. S. (1866), 46 High St., Chatteris, Cambs. (L.)
Clarke, M. D. A. (2060*), High Close, Thorsway, Caldy, Wirral, Cheshire. (L., esp. breeding)
Clarke, R. E. (2174*), 7 Woodberry Way, London, N.12. (L., O.)
Classey, E. W., F.R.E.S. (41), 91 Bedfont Lane, Feltham, Middx. (L., Mosquitoes)
Clatworthy, R. E. (2191*), The Folly, Cannington, nr. Bridgwater, Som. (L., C., O.)
Cockayne, Dr. E. A.,‡ 8 High St., Tring, Herts. (L.)
Coleridge, W. L. (2194), Ess Hill, Ashburton Rd., Newton Abbot, Devon. (Ornith., Bot., gen. ent., L.)
Coles, R. P. (2263*), 56 Westwood Ave., South Harrow, Middx. (L.)
Collier, Major A. E. (1066), Lynher, Horsham Rd., Cranleigh, Surrey.
Collier, A. S. F. (1980*), 6 Charnham St., Hungerford, Berks. (L., C.)
Collier, J. H. (1960*), Moorside, South Brent, S. Devon. (L.)
Collins, G. B. (1036), 19 Torridge Rd., Thornton Heath, Surrey. (gen. ent.)
Collins, R. J., F.R.E.S. (256), Dept. of Entomology, Natural History Museum, Cromwell Rd., London S.W.7. (L. esp. World Geometridae)
Collinson, W. E. (247), 20 Pye Nest Drive, Halifax, Yorks. (L. esp. Bombyces)
Collis, Miss M. (2228), Southlands College, 65 Wimbledon Parkside, London, S.W.19. (gen. ent.)
Collyer, N. A. B. (132), 27 Guildford Way, Wallington, Surrey. (L.)
Colman, K. E. S. (112), Fenton House, Fenchurch St., London E.C.3. (gen. ent.)
Combs, L. H. (2161*), 264 Tigertail Rd., Los Angeles 49, California, U.S.A.
Compton-Green, D. F. (2142), 7 Morris Rd., Southampton, Hants. (gen. ent.)
Conway, G. R. (2218*), 19 Upper Park Rd., Kingston-on-Thames, Surrey. (C., pestology)
Cook, B. (2242*), 4 Knavesmire Close, Harome, York. (R.)
Cooper, Beowulf A., B.Sc., A.R.C.S., F.R.E.S.,‡ 27 Spilsby Rd., Boston, Lincs. (gen. ent., L., M., E., econ. ent., C.)
Cooper, Mrs. L. d'O. (1408), 61 Okehampton Rd., London N.W.10. (gen. ent.)
Cornelius, J. A. (1020), 29 Grangecliffe Gdns., London S.E.25. (L.)
Cornes, M. A. (2126*), 3 Rowbury Drive, Ashley Rd., Burton-on-Trent, Staffs. (L., C.)
Cornes, T. G. (2101*), c/o I. Oppler, Villadale, P.O. Mazoe, S. Rhodesia. (L.)

Cove, Miss (612), Avery Hill Training College, Avery Hill Rd., Eltham, S.E.9.
Cowley, J., M.A., F.R.E.S. (771), Holywell House, Edington, Bridgwater, Som. (O. of world, D., H.)
Craig, A. J. (2013), 8 Foster Rd., London, W.4. (L.)
Craig, Miss J. C. D., B.Sc., A.R.I.C. (930), 2 Devonshire Gdns., Glasgow W.2. (L.)
Crammer, B. (2065*), 52 Elmfield Ave., Stoneygate, Leicester. (mic., B.)
Cribb, J. (2044), St. Rose, Ditchling Common, Hassocks, Sussex. (C.)
Cribb, P. W. (2270), 20 The Avenue, Moulsecoomb, Brighton, Sussex. (L.)
Cripps, C. H., M.A. (730), Bulls Head Farm, Eakley Lanes, Stoke Goldington, Newport Pagnell, Bucks. (L. esp. R.)
Crisp, E. (668), High Street, Heathfield, Sussex. (gen. ent.)
Crosby, D. F. (2121/AB124), 1 Kingston St., East Malvern, S.E.5. Melbourne, Victoria, Australia. (R.)
Cross, G. S. E. (1453), 31 Avenue Rd., London N.12. (L.)
Crotch, W. J. B., M.A., A.K.C. (1181), 6 Balmoral Mansions, E. Twickenham, Middx. (Silkmoths, fossil insects)
Crowther, R. F. (1942), 12 Foston Ave., Burton-on-Trent, Staffs. (gen. ent.)
Cruttwell, G. H. W. (118), Oldford House, Frome, Som. (L.)
Cullum, L. (1738), Harrington Cottage, Hallgate, Moulton, Spalding, Lincs. (L.)
Cunningham, D. (1233), 42 Rae St., Dumfries, Scotland. (L., Bot.)
Currie, P. W. E. (977), 102 Burdon Lane, Belmont, Sutton, Surrey. (Orth., H.)
Dale, A., B.Sc. (908), Castle Hall, Bakewell, Derbyshire. (Beekeeping, NH., gen. ent.)
Dale Fort Field Centre (2091†), Haverfordwest, Pembs., comm. to J. H. Barrett, Warden.
Dalton, R. F., M.A. (1530), The Dorset County Museum, Dorchester, Dorset. (Museum Display)
Daltry, H. W., F.R.E.S., M.S.B.E. (972), 68 Clifton Rd., Rugby, Warwickshire. (Hem., N., T., ML., C., H.)
Damsell, H. S. (2024), c/o Pelling, Stanley & Green Ltd., 51 Broad St., Bristol, 1. (L.)
Dangerfield, R. J. (2229*), 58 Longney Rd., Lower Tuffley, Glos. (C.)
Dannreuther, Capt. T., R.N. (60), Windycroft, Hastings, Sussex. (M.)
Darling, D. A. (2102*), 232 Ridge Rd., Sutton, Surrey. (L., C.)
Davidson, W. F., F.G.S. (2261), 9 Castlegate, Penrith, Cumberland. (L.)
Davies, M. J. (760), 31 Kinross Ave., Worcester Park, Surrey. (C. esp. Geodephaga)
Davies, R. K. (2189*), 43 Gelli Rd., Gelli Pentre, Rhondda, Glam. (L.)
Davis, Miss A. (2023*), 71 Bishop Rd., Bristol, 7. (gen. ent.)
Davis, Miss A. M. (2275), 125 Holbein House, London, S.W.1. (gen. ent.)
Davis, R. V. (1880), 2A School St., Rugby. (L.)
Dawes, A. J. (886), 17 Copse Hill, London, S.W.20. (L., C.)
Day, G. V. (29), Furlong Rd., Stoke Ferry, King's Lynn, Norfolk. (L.)
Deacon, Miss D. M. (1959), The Charles Johson Memorial Hospital, Nqutu, via Dundee, Zululand.
Desmares, M. (2069*), Woodside, Hudswell, Corsham, Wilts. (L.)
de Whalley, L. D. (1784*), 45 Devonshire Rd., Bexhill-on-Sea, Sussex. (L.)
de Worms, Baron C., Ph.D., F.R.E.S. (260), Three Oaks, Shore's Rd., Horsell, Woking, Surrey. (L.)
Dexter, S. (847), Rosevean, Constantine Bay, nr. Padstow, Cornwall. (gen. ent.)
Dibb, R. A. L. (1688), 255 Beverley Rd., Kirk Ella, E. Yorks. (L., C.)
Dicker, B. E. (1811), 1291 Christchurch Rd., Iford, Bournemouth, Hants. (L.)
Dixon, G. F. (1809), 63 War Lane, Harborne, Birmingham 17. (D., C.)
Dixon, M. E. (1674*), 18 Kingsholm Square, Gloucester. (L.)
Dobson, A. H. (2265), Sunningdale, Millbrook Park Rd., Torquay, Devon.
Dolton, H. L. (1122), 36 Chester St., Reading. (L.)
Donovan, H. J. (2269), 33 Holland Ave., London, S.W.20.
Donovan, N. J. (2268*), 33 Holland Ave., London, S.W.20.
Drummond, D. C. (2017), 11 Westbourne Park Rd., London, W.2. (C. esp. Chrysomelidae)

Dudding, Miss N. Z. (2227), Charles Edward Brooke School, Halsmere Rd., Camberwell New Rd., London, S.E.5. (gen. ent.)
Duffield, C. A. W. (2048), Pickersdane, Brook, nr. Ashford, Kent. (local L., C., H., D., Hom.)
Dunn, T. C. (1845), The Poplars, Chester-le-Street, Co. Durham. (L.)
Durham, J. (1174), 62 Reigate Rd., Brighton 5, Sussex. (NH.)
Durrant, K. C. (1375), 83 Sandy Lane, E. Dereham, Norfolk. (gen. ent., esp. D.)
Durrant, W. J. (1196), 64 Pine Gardens, Surbiton, Surrey. (D., O., C.)
Durston, J. H. J. (1997), 46 Southwell, Portland, Dorset. (C., L., H.)
Dyce, J. W. (1602), Hilltop, 46 Sedley Rise, Loughton, Essex. (L.)
Dyer, J. L. (2319), 38 St. Stephen's St., Tonbridge, Kent. (L., C.)
Dyson, R. C., N.D.H., F.R.E.S. (91), 112 Hollingbury Park Ave., Brighton 6, Sussex. (L., foodplants)
Eade, G. T. (190), 3 Rutland Rd., Hove 3, Sussex.
Eagles, T. R. (194), 32 Abbey Rd., Enfield, Middx. (L.)
Earl, B. C. A. (1388), 2 South Park, Loose Rd., Maidstone, Kent. (L.)
Edelsten, H. M., F.R.E.S. (208), Bramble Hill, Balcombe, Sussex. (L.)
Edwards, Miss K. (2063), Jasmine Cottage, Somerwood, Rodington, Shrewsbury, Salop. (L., O., NH.)
Edwards, N. (2057*), 52 Little Paddocks, Ferring, Sussex. (L., C., gen. ent.)
Edwards, R. C. (949), Arlesey, Pilgrim's Way, Westerham, Kent. (gen. ent.)
Eggleston, A. (2233), 3 Holmlands Park, Chester-le-Street, Co. Durham. (C., L.)
Eley, R. (1201), c/o Mr. Ruddock, Hall Cottages, Nowton, nr. Bury St. Edmunds, Suffolk. (L. Heterocera)
Emmet, A. M., M.B.E., M.A. (1379), St. Edward's School, Oxford. (L.)
Evans, G. C. (1788), 159 North Walsham Rd., Old Catton, Norwich, Norfolk.
Evans, J. O. (1840), 35 Maesygarreg, Cefn Coed, Merthyr Tydfil, S. Wales. (L., C., fw. gen.)
Evans, M. E. G. (2166), 55 Abbotsbury Gdns., Eastcote, Pinner, Middx. (C.)
Ewart, A. (1861*), 220 Southwark Pk. Rd., London, S.E.16. (L.)
Ewing, A. W. (1731), 14 Hamilton Terrace, Portobello, Midlothian. (ML.)
Ewing, K. W. (1121), Castleway, Calne, Wilts. (L. esp. breeding)
Exmouth Training College (1643†), Rolle Rd., Exmouth. Com. to Mrs. Leadley-Brown. (L.)
Farley, K. (1813), Lashenden Villa, Biddenden, Kent. (C., experimental ent.)
Farwell, I. G. (1445), Mayfield Villa, Portmore, Lymington, Hants. (L.)
Fenn, J. L. (1665), "Fernleigh", Oxborough Rd., Stoke Ferry, nr. King's Lynn, Norfolk. (L.)
Ferguson, E. A. (1311), 1213 Bellflower Ave. S.W., Canton 4, Ohio, U.S.A. (L.)
Fidler, Dr. J. H. (1256), Ministry of Agriculture and Fisheries, University College of South Wales and Mon., Cathay's Park, Cardiff. (T., Hem. esp. Aphididae)
Field Club, The (1882†), Grammar School, Houghton - le - Spring. Com. to G. F. W. Hart. (gen. ent.)
Fielder, L. H. (2183*), 23 Tabley Grove, Knutsford, Cheshire. (L.)
Filbee, A. G. (2279*), 356 Preston Rd., Harrow, Middx. (L., C.)
Finlay, J. F. (806), Windgate Farm, Combe Raleigh, nr. Honiton, Devon. (L.)
Finlay, Capt. R. A. L., M.B.E. (229), 174 Braid Rd., Edinburgh 10. (gen. ent.)
Fisher, J. M. (1305), Old Rectory, Ashton, Northampton. (L.)
Floyd, J. F. M. (2018), High Bridge Mill, Cuckfield, nr. Haywards Heath, Sussex. (H., B., spiders)
Fluck, G. C. (569), Redroof, Reading Rd., Fleet, Hants. (L.)
Fonseca, E. C. M. (2079), 18 Grange Park, Henleaze, Bristol. (D., Het.)
Ford, Rev. G. A. (377), Balsham Rectory, Balsham, Cambs. (L.)
Ford, T. H. (1642), 275 Derbyshire Lane, Sheffield 8. (L.)
Fordham, R. (2076*), 82 Grange Rd., Gillingham, Kent. (gen. ent., mic., L.)
Fox, K. J. (1459*), 20 Scotsdale Rd., London S.E.12. (L.)
Fox, T. H. (105), 226 St. Albans Rd., Watford, Herts. (L., breeding)

Fraser, Lt.-Col. F. C., I.M.S. Retd. (890), 55 Glenferness Ave., Winton, Bournemouth, Hants. (O., N., Orth.)
French, R. A. (2129), Rothamsted Experimental Stn., Harpenden, Herts. (M., E., gen. ent.)
Freedman, M. (2310*), 33 Highlands, Edgware, Middx. (gen. ent., C.)
Freeman, John A., Ph.D. (986), 5 Woodmere Way, Beckenham, Kent. (Stored Products ent.)
Friday, E. J. (2292), 2577368 L.A.C. Friday, E. J., Officers' Mess, R.A.F., Pershore, Worcs. (L., O.)
Gardiner, B. O. C. (225), 34a Storeys Way, Cambridge. (L., gen. ent., N.)
Gardiner, Lt.-Col. C. J. (2167), 7 Beaufort Rd., Clifton, Bristol 8. (L.)
Garraway, G. J. (1826*), 45 Albert Rd., Coleford, Glos. (L., ML.)
Garrett-Jones, C. (989), Iken Hall, Woodbridge, Suffolk. (L., D.)
Gates, M. D. C. (1992), 5 Garden Close, Banstead, Surrey. (R.)
Gathergood, Miss A. L. (2005), c/o Mrs. Heath, No. 1 Fernbank Cottages, Midhurst Rd., Fernhurst, nr. Haslemere Surrey. (gen. ent., breeding)
Gaze, W. E. (1812), The Cedars, Castle Hedingham, Halstead, Essex. (L.)
Gent, P. J. (192), Irthlingborough Rd., Wellingborough, Northants. (L.)
Gent, S. (2030), Viewmount, Moffat, Dumfriesshire. (H., D.)
George, Miss B. W. (2238), Flat 3, 87 Church Rd., Richmond, Surrey.
George, R. S. (1402), 1 Podsmead Place, Gloucester, General Recorder of Glos. Insects. (C., orth., Siphonaptera, bryology)
Gerard, Hon. R. (359), Blakesware, Ware, Herts. (L.)
Gibbons, Miss M. B. (2226), 74 Wavertree Court, Streatham Hill, S.W.2.
Gibbs, G. W. (1212*), Tree Tops, Muritai Rd., Eastbourne, Wellington, New Zealand. (gen. ent.)
Gibbs, H. L., B.E.M. (2036), Sun-dial Cottage, Balscote, nr. Banbury, Oxon. (L.)
Gilbert, A. E. H. (1631), 5 The Avenue, Hatch End, Middx. (L.)
Gilder, B. E. (2112), 138 Braemar Rd., N.W.10. (H.)
Giles, W. (2241*), 22 Priory Crescent, Wembley, Middx. (L.)
Gingell, L. V. H., F.L.S., F.Z.S. (2285), South Farnborough School, Reading Rd., Farnborough, Hants. (exot. insects, esp. L.)
Gladdish, J. H. (2234*), 235 Capworth St., London, E.10. (C., H., D.)
Goatly, M. J. (2133*), 22 Lonsdale Gdns., Thornton Heath, Surrey. (gen. ent.)
Gobbett, D. J. (1839), 6 Ramsden Drive, Collier Row, Romford, Essex. (L.)
Goddard, L. (1801), Kent Farm Institute, Sittingbourne, Kent. (agric. pests, H.)
Goddard, P. A. (2206*), 69 Weighton Rd., Harrow Weald, Middx. (C., aq. ent.)
Goddard, P. F. (1881), 8 Calverley Rd., Stoneleigh, Ewell, Surrey. (L.)
Goide, P. (2216*), 12 Nesta Rd., Woodford Green, Essex. (L.)
Golby, W. A. (1412), 136 Milner Rd., Birmingham 29. (gen. ent.)
Goodbody, G. (1470), 14 Downs Valley Rd., Woodingdean, nr. Brighton, Sussex. (L.)
Goodman, A. de B. (920), 20 Brooklands Ave., Cambridge. (gen. ent.)
Gough, Miss F. M. (1786), 42 Rocky Lane, Broad Green, Liverpool 16. (gen. ent.)
Gowing-Scopes, E. (909), Oakhurst, Oakwood Rd., Crofton, Orpington, Kent. (L., C.)
Grace, J. (2097), 72 The Crescent, Ravensthorpe, Dewsbury, Yorks. (L.)
Graham, Mrs. E. M. (2207), c/o Major Graham, 1st Field Regt., Arab Legion, Jordan, M.E.L.F. (L.)
Graham, E. W. (1142), Windy Ridge, Little Widbury, Ware, Herts. (L.)
Graham, Miss T. (2208*), Thurstan, Sherborne School for Girls, Sherborne, Dorset.
Grant, F. T. (276), 45 Shepway Ave., Maidstone, Kent. (C., L.)
Gray, W. J., M.R.C.V.S., F.R.E.S. (1843), c/o Dept. of Veterinary Service, Blantyre, Nyasaland, Central Africa. (L., D.)
Greaves, C. (2215), Church St., Youlgreave, Derbyshire. (Breeding Brit. L.)
Green, C. D. (2043*), c/o J. E. Roberts, 76 Hough Green, Chester. (L.)
Green, J. (1044), Zoology Dept., Bedford College, Regents Park, London, N.W.1. (C., gen. ent.)
Green, J. G. (1795), The Lodge, Fairmead Side, Nursery Rd., Loughton, Essex. (C.)
Greenhill, J. S. (1883), 7 Barnett Wood Lane, Ashtead, Surrey. (L.)

Greenslade, P. J. M. (2211*), Machon Bank, Maryfield Ave., Exeter, Devon. (C., NH.)
Greenwood, R. S. (757), 22 Maidstone Rd., Rochester, Kent. (L.)
Gregory, N. G. (2290*), 61 Marlborough Rd., Falmouth, Cornwall. (gen. ent.)
Grimwood, K. W. (1625), 20 Lancing Rd., Newbury Park, Ilford, Essex. (L.)
Gripper, A. G. (1836), Springates Cottage, Henham, nr. Bishop's Stortford, Herts. (L. esp. Sphingidae)
Groves, E. W. (1792), 143 Carshalton Park Rd., Carshalton, Surrey. (gen. ent.)
Guile, C. T. (1752), 51 Coity Rd., Bridgend, Glamorgan. (parasitic orders)
Hague, N. G. (943), 39 Heath Drive, Potters Bar, Middx. (L., O.)
Halkier, W. W. L. (1829), "Arnprior", Thorp Ave., Morpeth, Northumberland. (gen. ent.)
Hall, Rev. J. H. V. (1520), Hutton Roof Vicarage, Kirkby Lonsdale, via Carnforth, Lancs. (L.)
Halstead, D. G. H. (2321*), 12 Marish Court, Langley, Bucks. (C., Het.)
Ham, B. J. (1327), "Mona", Kings Saltern Rd., Lymington, Hants. (L.)
Hamlyn, E. T. (1923), 8 Kingsley Rd., Plymouth, Devon. (gen. ent.)
Hammond, D. (1846), Brentwood, Hookergate, Cowlands Gill, nr. Newcastle, Co. Durham. (C., gen. ent.)
Hammond, H. E., F.R.E.S. (423), 16 Elton Grove, Birmingham 27. (L., ML., C., gen. ent.)
Hands, A. (2155*), 100 Station Rd., Handsworth, Birmingham 21. (L.)
Hands, R. W. (2153*), 100 Station Rd., Handsworth, Birmingham 21. (L.)
Hanson, J. (2198), 78 New St., Paddock, Huddersfield, Yorks. (gen. ent. esp. L.)
Hanson, M. K. (1653), 145 Staveley Rd., Leicester. (L., Insect Classification)
Hanson, P. D. (1889), The Peak Bungalow, Compton Bishop, nr. Axbridge, Somerset. (L.)
Hanson, S. M. (320), 167 Gunnersbury Park, Pope's Lane, W.5. (L.)
Harding, C. J., B.Sc. (894), BM/NEWT, London W.C.1. (B.)
Harding, J. G. R. (1669), 37 Chestnut Ave., Withernsea, E. Yorks. (L.)
Harding, S. A. (2282*), 83 Christchurch St., Ipswich, Suffolk. (C., H., D.)
Hardman, G. A. (2050*), 16 Lindleywood Rd., Fallowfield, Manchester, 14. (L.)
Hardman, J. A. (1234), 10 Hands Lane, Bury Rd., Rochdale, Lancs. (gen. ent., L., ML., NH., Bot., ornith.)
Hards, C. H. (176), 40 Riverdale Rd., London S.E. 18. (L., mic.)
Harle, D. F. (889), "The Studio", Strand St., Sandwich, Kent. (E.)
Harper, Comdr. G. W., R.N. (1169), Neadaich, Newtonmore, Inverness-shire. (L., gen. ent.)
Harper, M. W. (1553*), Neadaich, Newtonmore, Inverness-shire. (L., gen. ent.)
Harper, P. S. (2284*), 11 Boutport St., Barnstaple, N. Devon.
Harris-Evans, Rev. F. D. (1999), Blaston Rectory, Market Harborough, Leics. (L.)
Harrison, D. G. (1689), 125 Mawson Rd., Cambridge. (gen. ent. esp. R.)
Harrison, E. (1676), 53 Borrowdale Rd., Lancaster. (L.)
Harrison, Prof. J. W. Heslop, D.Sc., F.R.S., F.R.E.S. (716), Gavarnie, The Avenue, Birtley, Co. Durham. (gen. ent., L., Biogeography)
Harrison-Gray, M. (1806), 36 Eton Avenue Garage, Lancaster Grove, London N.W.3. (Saturniidae)
Hart, B. H. (1816), 94 Ramsey Rd. North, Dovercourt, Essex. (H.)
Hartley, J. C. (1939), The Poplars, Fulbourn, Cambs. (L.)
Hatcher, F. L. (1441), 18 St. Edmunds Drive, Stanmore, Middx. (D.)
Hawdon, A. S., B.Sc. (1469), 18 Saville Rd., Twickenham, Middx. (L.)
Haxby, C. R. (1508), 4 Windermere Terrace, Bradford 7, Yorks (L., gen. NH.)
Haynes, R. F. (834), 29 Fairfield Drive, Dorking, Surrey. (L., gen. ent., Bot.)
Haynes, R. G. (1545), 5 Lucas Terrace, Lucas Lane, Plympton, Plymouth, Devon. (L.)
Haywood, N. (1924), 22 Station Rd., Ruskington, Sleaford, Lincs. (L.)
Heard, M. J. (595), 65 Park Side, Didcot, Berks. (L. esp. Genetics)
Heley, R. G. (731), 3a High St., Burcott, Wing, Leighton Buzzard, Beds. (L., Bot.)
Hellings, G. E. A. (297), 49 Wheatsheaf Close, Woking, Surrey. (L.)

Henderson, C. W. (21), 150 Knightthorpe Rd., Loughborough, Leicestershire. (C., Brit. and exot.)
Henniker-Heaton, G. (2199), W.D.I., Petauke, N. Rhodesia. (gen. ent.)
Henstock, Dr. H., Ph.D., M.Sc., F.I.C. (209), Glengariff, Caerwys, Mold, Flint. (L.)
Heppell, D. H. (1690), 3 Jacomb Place, Bridgemary, Gosport, Hants. (L.)
Herbert, D. A. H. (2201*), Grove Villa, Elmgrove Rd., Hardwicke, nr. Gloucester. (L., C.)
Herbert, I. D. (2257*), 18 Leamington Close, Bromley, Kent. (L.)
Heselden, A. J. M., B.Sc. (2084), 85 Park Hill Rd., Bexley, Kent. (L., esp. sub-spp. & local variation, Bot.)
Hesselbarth, G. (1761), (23) Diepholz/Hann, Röhlingstrasse 8, Germany. (L.)
Hewson, F. (601), 23 Thornhill Drive, Shipley, Bradford, Yorks. (L.)
Hick, A. E. (567), Sherrards, Cricket Field Lane, Bishop's Stortford, Herts. (O., H.)
Higginbottom, E. (2266), 2 Greystone Cottage, Main Rd., Hathersage, Derbyshire. (L. esp. breeding)
Higgins, W. J. (2072*), Standard Nurseries, Old Worthing Rd., East Preston, Angmering, Sussex. (L. esp. Nymphalidae & wainscots)
Hill, B. E. (2195*), 59 Mill Hill Lane, Winshill, Burton-on-Trent, Staffs. (L., O.)
Hill, M. A. (2204*), 19 Falfield Rd., Lower Tuffley, Gloucester. (R.)
Hill, R. R. H. (2253*), Moor Lodge, Moor Lane, Staines, Middx. (D., L.)
Hilliard, R. (99), 54 Gyles Park, Stanmore, Middx. (L., NH.)
Hinchliffe, B. A. (2309*), Arundel, King's Hill, Beech, nr. Alton, Hants. (L., H.)
Hitchens, P. E. N. (669), Sicklebank, Horam, Sussex. (L. esp. temperature trials on pupae)
Hobbs, C. R. (1850*), 135 Doncaster Rd., Southmead, Bristol.
Hodder, M. R. (1971*), 13 South Rd., Wyke Regis, Weymouth, Dorset. (C., L.)
Hodges, G. B. (314), 12 London Rd., Braintree, Essex. (L.)
Hodgkinson, R. (2042), Lindon, Lynch Rd., Farnham, Surrey. (Acridiodea esp. Mole Crickets, H.)
Hodgson, E. (2086), 9 Station Rd., Hetton-le-Hole, Co. Durham. (D. esp. Culicidae)
Hodson, E. V. (1392), 19 Stamford Rd., West Bridgford, Nottingham. (L.)
Holmes, A. M. (1198), The Universal Electrical Service, Bath St., Walsall, Staffs. (L.)
Holroyd, E. M. (1139), 9 Lawrence Rd., Hazel Grove, Stockport, Cheshire. (L., breeding and genetics)
Homewood, C. T. H. (1873), 38 Ditton Park Estate, New Road, Ditton, nr. Maidstone, Kent. (L.)
Honeybourne, T. J. (1558), 97 Birchwood Rd., Wilmington, Dartford, Kent. (L.)
Hope Professor, The (666), Hope Department of Entomology, University Museum, Oxford. (Bionomics)
Hopkins, Miss B. A. (827), The Agricultural Institute, Kirton, Boston, Lincs. (L., breeding)
Horner, L. B. (917), 68 Bolckow St., Guisborough, Yorks. (gen. ent.)
Horton, H. V., M.Ph.S., M.B.S., M.S.P.A., A.R.I.Chem. (1955), 315 The Greenway, Epsom, Surrey. (gen. ent.)
Horton-Ormerod, S. (1370), 17 Kenwood Rd., Moss Bank Park, Bolton, Lancs. (Arachnology)
Hosking, C. (2022), 115 Wilton Rd., Southampton, Hants. (P.)
Howarth, T. G., B.E.M., F.R.E.S., F.Z.S. (1627), Arrochar, Barnet Gate, Arkley, Herts. (L.)
Howe, M. C. R. (2203*), 33 Tarrington Rd., Gloucester. (R.)
Howgill, C. H. C. (2128*), 56 Woodfield Lane, Ashtead, Surrey. (L.)
Howton, D. H. (2123), 7 St. Vincents Rd., Dartford, Kent. (L.)
Hudson, G. E. C. (2143), S.G.B., Wadshair, Hassa Heissa, Sudan. (R.)
Humphrey, J. C. (2144), Woodside, Chiddingly, nr. Lewes, Sussex. (C.)
Humphrey, S. W. (386), Pear Tree House, Roade, Northants. (R.)
Hunt, H. F. (1730), 41 Granada Rd., Southsea, Hants.
Hunt, J. W. C. (1988), Orchard Side, Waltham, Kent. (gen. ent.)
Hunt, W. (2014), 2 Park Villas, Barnstaple, Devon. (C.)
Hurrell, F. J. (923), 46 Goldlay Ave., Chelmsford, Essex. (L.)
Hurst, A. (1618), The Garage, Guildford Rd., Cranleigh, Surrey. (L.)
Hutchison, Flt/Lt. D. (919), 246 Muirhall Rd., Larbert, Stirlingshire. (World R. esp. Brit. and European)

Huxtable, A. (2156*), 78 Toynbee Rd., London, S.W.20. (C., L., Silkmoths)
Hyatt, K. H. (1411), 3 Kidbrooke Gdns., Blackheath, S.E.3. (L.)
Hyde, G. E., F.R.E.S. (818), 20 Woodhouse Rd., Doncaster, Yorks. (L., O., H.)
Hyde, R. H. (2164), The Firs, Finchampstead, Berks. (C., D., L.)
Hyde-Wyatt, B. (1548), 108 Lindsay Rd., Worcester Park, Surrey. (gen. ent., O., L., H.)
Hynes, Mrs. V. D. P. (686), 152 Meachem Ave., Battle Creek, Michigan, U.S.A. (Silkmoths)
Idle, C. M. (2118*), 67 Murray Ave., Bromley, Kent. (C.)
Ika, Miss N. O. (1423), c/o Mr. E. Etta, Medical Dept., Mamfe, British Cameroons.
Innes, Miss S. (1663*), Learney, Torphins, Aberdeenshire. (L.)
Irwin, Roderick R. (1220), 411 North Bloomington St., Streator, Illinois, U.S.A. (R.)
Isbill, M., F.R.E.S. (2026), Technical Dept., Orkin Exterminating Co., Inc., 102 City Park Ave., New Orleans, Louisiana, U.S.A. (C., Orth., Isoptera)
Ison, C. H. (1343), 47 Orford Rd., London E.17. (H., mic., P.)
Jackson, Miss Dorothy J., F.L.S., F.R.E.S. (1124), North Cliff, St. Andrews, Fife. (gen. ent., C., H.)
Jackson, S. M. (1269), 15 Westbourne Rd., Selby, Yorks. (L.)
James, W. H. (120), 33 West Hill, Epsom, Surrey. (L. esp. R., Sphingidae)
Janes, C. T. (1635), 151 Warwick Rd., Edmonton, London N.18. (gen ent.)
Janes, J. A. (614), 1 Ailsa Terrace, Tiverton, Devon. (L.)
Jarvis, C. J. (2190), 9 Kingsway Parade, High St., Barkingside, Essex. (L.)
Jarvis, C. MacKechnie, F.L.S. (650), 21 Spenser Rd., Harpenden, Herts. (C., econ. ent.)
Jarvis, R. A. (2255*), Greenhedges, Vicarage Lane, Silsoe, Beds. (L.)
Jeavons, J. S. (1982), 130 Wellfield St., Warrington, Lancs. (C.)
Jefferson, T. W. (242), 37 Riversdale Terrace, Sunderland, Co. Durham. (R.)
Jeffreys, Dr. D. M., M.B., B.Ch. (615), 116 Hurst Grove, Bedford. (L., ornith., gen. ent.)
Jeffries, R. (2312*), Bordesley Park Farm, Redditch, Worcs.
Jeffs, G. A. T. (910), Nuns Holm, Nuns Corner, Grimsby, Lincs. (gen. ent.)
Jeremy, Dr. W. H. R. (1778), 6 Elm Grove Rd., Exeter. (C.)
Jesper, D. M. (1152), 23 Woodlands Grove, Harrogate, Yorks. (L., C., H., Beekeeping)
Johnson, J. H. (1040), 53 Knighton St., Hepthorne Lane, nr. Chesterfield, Derbyshire. (C., H.)
Johnson, R. H. (2154*), Rose Lawn, St. Nicholas Place, Sheringham, Norfolk. (L.)
Jones, A. V. (1633), "Hafod", Lower Cardiff Rd., Pwllheli, N. Wales. (C.)
Jones, A. W. (1165), 15 Suffolk Rd., South Norwood, S.E.25. (D.)
Juniper Hall Field Centre (2089†), Juniper Hall, nr. Dorking, Surrey. (Warden: G. E. Hutchings)
Kearn, G. C. (2100*), 119 Pinfold Lane, Penn, Wolverhampton, Staffs. (gen. ent., esp. L., C., O.)
Keefe, J. A. P. (2222*), 657 Fulham Rd., London S.W.6. (L., aq. ent.)
Keen, W. E. (1743), The Bungalow, Cap Glas, Bettws, nr. Abergavenny, Mons. (Arachnida)
Keetch, J. B. (2046), Rylstone, Compton Rd., South Petherton, Som. (L., O., C.)
Keji, J. A. (571), Biggs Memorial Hospital, Ithaca, N.Y., U.S.A. (L. larvae, esp. Saturniidae, Notodontidae, Eucleidae)
Kennington, F. E. (1549), Lodge Farm, Benningholme Lane, Skirlaugh, nr. Hull, Yorks. (D., C., gen. ent.)
Kennard, A. H. (1698), 11 Marton Rd., Long Itchington, nr. Rugby, Warwickshire. (L., H.)
Kennard, H. A. (1871*), Torns, Ashburton, S. Devon. (L.)
Kennedy, A. (20), 130 Vesper Rd., Leeds 5, Yorks. (L.)
Kerrich, G. J., M.A., F.R.E.S. (551), Heath Crest, Westcott, Dorking, Surrey. (H., Parasitica)
Kettlewell, Dr. H. B. D., M.A., M.B., B.Chir., M.R.C.S., L.R.C.P., F.R.E.S. (706), Breakers Hotel, St. James, Cape Town, S. Africa.
Keylock, J. G. (471), 34 East St., Crewkerne, Som. (D., aq. ent.)
Kindred, A. D. (1707), 27 Richmond Ave., East Bedfont, Middx. (L.)
King's Norton Grammar School for Boys (2099†), Birmingham, 30. Comm. to G .B. Hindle.
Kirkham, G. G. (2185), 210 Wakefield Rd., Normanton, Yorks. (NH.)

Kluth, G. A. (2301), 219 Holborne Rd., London S.E.3. (Aphididae, L.)

Knight, G. (2250), 4 Council Houses, Alhampton, Ditcheat, nr. Shepton Mallet, Som. (gen. ent.)

Knight, J. E. (94), Doughton Cottage, Ross-on-Wye, Herefordshire. (L. rearing)

Knight, Major Maxwell, O.B.E., F.R.M.S., F.L.S. (956), The Homestead, Park Rd., Camberley. (aq. ent., moths, mic.)

Knight, R. (2209*), Chettles, South Rd., Ditchling, Sussex. (C., H., L.)

Krauss, N. L. H. (1471), 2437 Parker Place, Honolulu 5, Hawaii. (Trypetidae)

Laing, I. W. (2117), 1 Brookside, East Barnet, Herts. (L., O.)

Lamb, D. F. (1915), 3 Queensthorpe Rd., Sydenham, London S.E.26. (L.)

Lane, A. W. (1744), 178 Ravenscourt Rd., Beckenham, Kent. (L., C.)

Langford, P. G. (1630), Moordown, 7 London Rd., Widley, Portsmouth. (L.)

Larkin, J. M. (2187), 31 Axminster Rd., London N.7. (L.)

Last, H. R. (117), 12 Winkworth Rd., Banstead, Surrey. (C., esp. Brit. and foreign Staphylinidae)

La Touche, Dr. A. A. D. (884), 21 Alwoodley Gardens, Moortown, Leeds, Yorks. (Arachnida)

Le Clercq, Dr. J. (1055), Laboratoires de Biochimie de l'Université de Liége, 17 Place Delcour, Liége, Belgium. (physiological ent., H.)

Leeds, H. A. (282), Wood Walton, Hunts. (L. esp. R. vars.)

Lees, F. H. (375), The Gables, Maidencombe, Torquay, S. Devon. (L.)

Lees, J. A. G. (1779), 37 Gawber Rd., Barnsley, Yorks. (L.)

Lees, P. (1859*), 35 Manchester St., Oldham, Lancs. (P. of L. larvae)

Le Masurier, P. C. (978), 85 Warren Drive, Tolworth, Surrey. (L.)

Leonard, B. E. (1708), 28 Brownhill Rd., Chandler's Ford, Eastleigh, Hants. (L.)

Leonard, B. G. (96), 29 Storeton Rd., Oxton, Birkenhead, Cheshire. (L. Sphingidae)

Levett, R. J. R. (1867), Netheroak, Stockcroft Rd., Balcombe, Sussex. (L., O.)

Lewis, A. D. (2243*), 30 Crwys Rd., Cathays, Cardiff, Glam. (L., Anisoptera, Ichneumonoidea)

Lewis, E., F.R.E.S. (952), 8 Parry Rd., London S.E.25. (C.)

Lewis, Rev. E. S. (373), Berwyn, Rhuddlan, Flintshire. (L.)

Lewis, H. W. (2272), 40 Norcott Rd., London N.16. (mic.)

Lightfoot, E. G. (2131), 19 Victoria St., Aberdeen. (D.)

Ling, R. B. (1885), The Severells, Rectory Lane, Sidcup, Kent. (L.)

Lisney, Dr. A. A., M.A., M.D., F.R.E.S. (315), Dune Gate, Clarence Rd., Dorchester, Dorset. (L., ML.)

Little, J. C. (563), 70 Langley Way, West Wickham, Kent. (L. including exot.)

Lloyd, R. W. (445), The Grange, Bampton, Oxford. (C.)

Lobb, J. (1608), Fernbank, Yarborough Rd., Wroxall, I. of Wight. (gen. ent.)

Lockington, N. A. (1421), 23 Stonards Hill, Loughton, Essex. (C., H.)

Lofting, R. G. (1950), Lodge Cottage, Preston, Uppingham, Rutland. (L.)

Lomas, B. (1984*), 184 Trafalgar St., Ashton-under-Lyne, Lancs. (L., O.)

Long, A. G., M.Sc. (2278), The Green, Gavinton, Duns, Berwickshire. (L., T.)

Long, W. H. (1565), Ashleigh, Limes Rd., Tettenhall, Wolverhampton, Staffs. (L.)

Longfield, Miss C., F.R.E.S. (1039), 11 Iverna Gdns., London W.8. (O.)

Loose, H. W. C. (2115*), Selworthy, Connaught Ave., Frinton-on-Sea, Essex. (L.)

Lord Wandsworth College (1019†), Long Sutton, Basingstoke, Hants. Comms. to: F. D. Goodliffe.

Lorimer, Dr. J. A. (576), 23 King's Ave., Buckhurst Hill, Essex. (L.)

Lorimer, R. I. (600), Braeside, Pine Grove, London N.20. (L.)

Lothian, D. M. (964), Backhill Cottage, East Hallside, Cambuslang, Glasgow. (L., C.)

Lower School of John Lyon Nat. Hist. Soc. (2295†), Middle Rd., Harrow, Middx. Comms. to: B. Goode. (gen. ent.)

Lydgate-Bell, H. G. (1176), 32 Hastings Way, Croxley Green, Herts. (L.)

Lyon, F. H. (1026), Green Headland, Sampford Peverell, Tiverton, Devon. (L.)

Mabbott, T. W. (1986), 20 Forth St., Grangemouth, Stirlingshire. (agric. ent.)
Mackworth-Praed, Lt. Col. C. W. (392), Castletop, Burley, Hants. (ent., Z., ornith.)
Maclaurin, A. M. (1282), Oldhallhouse, Kilmacolm, Renfrewshire. (gen. ent.)
McCulloch, J. C. (2311*), Lambton Park, Chester-le-Street, Co. Durham. (L., H.)
MacGerard, B. (2160), 68 Fern Lane, Heston, Middx. (gen. ent.)
McNally, P. (1429), 11 Tennant Rd., Paisley, Renfrewshire.
Maggs, P. (244), Colyton Sway, Lymington, Hants. (L.)
Major, A. P. (1117), 21 Tufton Rd., Rainham, nr. Gillingham, Kent. (NH., gen. ent.)
Malham Tarn Field Centre (1595†), nr. Settle, Yorkshire. Com. to P. Holmes, M.A., Warden. (gen. ent.)
Manly, G. B. (427), 72 Tenbury Rd., King's Heath, Birmingham. (L.)
Manning, S. A., F.L.S., F.R.S.A. (1774), The Grammar School, Shoreham-by-Sea, Sussex. (H., Insect Galls).
Mansfield, M. J. (134), 5 Chigwell Rd., Bournemouth, Hants. (gen. ent.)
Manson, A. (1727), 13 Park Ave., Portobello, Midlothian. (L.)
Marsden, C. (1904), 11 Worrall Drive, Worrall, Sheffield, Yorks. (L.)
Martin, E. L. (801), 9 Devonshire Rd., Harrow, Middx. (L., esp. ML., T.)
Martin, P. M. (1741*), 310 Cowley Rd., Oxford. (L.)
Mason, C. (2028), Drakes Court, Fishers Pond, nr. Eastleigh, Hants. (Silkmoths)
Mason, J. M. (2033), 77 Trejon Rd., Old Hill, Staffs. (L.)
May, J. T. (1775), Homeland, Beech, Alton, Hants. (L.)
Mead, W. J. (1578), 58 Cedar Lawn Ave., Barnet, Herts. (L.)
Menneer, R. R. (1947), Bonallack, Gweek, Helston, Cornwall. (L. esp. *Maniola jurtina*, Meadow Brown)
Menzies, I. S. (585), Eden Roc, Florida Rd., Ferring-by-Sea, Sussex. (L., ML., C., H.)
Michaelis, H. N. (1216), 10 Didsbury Park, Manchester 20. (L. including Indian R.)
Midlen, C. (1769*), Glentorr, Bideford, N. Devon.
Mid-Somerset Naturalist Soc., The (2217†). Comms. to: Miss E. Palmer, Highfield, Sandford Hill, Bridgwater, Som.
Miles, B. R. (1613*), 303 Selsdon Rd., South Croydon, Surrey. (L.)
Miller, S. W. (1287), 5 Bedford Terrace, Portobello, Midlothian. (L., C.)
Millon, R. (1496), 73 Rue Jenner, Fives-Lille, Nord, France. (gen. ent.)
Mills, G. (1876), 120 Greengate St., Oldham, Lancs. (C., L., O.)
Mills, H. C. (1228), Thornycroft, Greenway, Hutton Mount, nr. Brentwood, Essex. (H., L.)
Milner, C. (2219), 117 Car Bank St., Atherton, Manchester. (L., gen. ent.)
Mitchell, S. C. (1945), 22 Ashley Rd., Bingley, Yorks. (gen. ent.)
Mold, B. (2148*), Chessington Secondary School, Chessington, Surrey. (gen. ent.)
Molyneaux, S. R. (1180), 40 Coxford Rd., Maybush, Southampton, Hants. (gen. ent. esp. C.)
Moore, D. M. (1248), Thom Hill House, Prospect Place, Barnard Castle, Co. Durham. (L., gen. ent.)
Moore, J. (146), Kemerton Lodge, nr. Tewkesbury, Glos. (L.)
Moppett, A. A., B.A. (1841), 39 Fairdale Gdns., Hayes, Middx. (gen. ent.)
Morgan, H. G., M.A. (90), Staplake Mount, Starcross, Exeter, Devon. (Hem. esp. Aphididae, aq. Het., E., gen., econ., and agric. ent.)
Morgan, J. E. (2302*), 28 Skelton's Lane, London E.10. (C.)
Morgan, J. R. (1515), 17 Park Ave., Barnoldswick, via Colne, Lancs. (L.)
Morgan, R. P. W. (2259*), Stourwood Cottage, Ramsey, Harwich, Essex. (L.)
Morris, J. E. G. (2283), Flat 2, 6 Bristol Gdns., London S.W.15. (gen. ent.)
Morris, M. (1678), 9 King's Ave., Lowton-St-Mary's, nr. Warrington, Lancs.
Morris, W. H. H., M.P.S. (2025), 66 Wells Rd., Penn, Wolverhampton, Staffs. (L., esp. rearing)
Morrison, I. D. (1985*), 14 Cleveland Ave., Radipole, Weymouth, Dorset. (C., Hem.)
Morrison, N. H. (2107*), 9 Barclay Terrace, Edinburgh 10. (C.)

Morton, J. K. (522), The Manse, The Avenue, Birtley, Co. Durham. (L.)

Moss, B. T. M. (1335), 37 Courtault Close, Halstead, Essex. (H., L.)

Muncaster, D. M. (2138*), 32 Foxgrove Road, Beckenham, Kent. (L.)

Murchie, W. R. (634), Box 203, Sharon, Pennsylvania, U.S.A. (L., gen. ent., Z.)

Murray, Dr. H. (177), Ashbourne, Clonmel, Co. Tipperary, Eire. (L.)

Myatt, G. (1767), 22608957 Pte. G. Myatt, Intelligence Corps, J.A.P. I.C. Det., R.A.F. Station, Butterworth, C.G.P.O., Penang, Malaya. (L.)

Narbeth, B. (1894*), Culner House, 36 Linden Rd., Bedford. (L.)

Nathan, L. (428), 16 Milton Crescent, Cheadle, Cheshire. (ent., L.)

Nature Conservancy, The (1901†), 91 Victoria St., S.W.1. Com. to Lt. Col. W. B. L. Manley.

Neal, E. G., B.Sc. (467), Foxcombe, Greenway Rd., Taunton, Som. (L., C., Hem., P.)

Nelson, J. M. (1751), The Shieling, Castletown, Isle of Man. (gen. ent.)

Ness, A. R. (549), 15 Homefield Ave., Newbury Park, Ilford, Essex. (L.)

Neville, A. C. (2145*), 97 Tetbury Rd., Horninglow, Burton-on-Trent, Staffs. (gen. ent.)

Newman, L. H. (503), The Butterfly Farm, Bexley, Kent. (L.)

Newson, P. (842), 19 Rowlands Keld, Hutton Gate, Guisborough, Yorks. (L.)

Newton, Dr. A. H., M.B., Ch.B., F.R.E.S. (1140), The C.J.M. Hospital, Nqutu, via Dundee, Zululand, S. Africa. (O., C.)

Newton, J. (439), 11 Oxleaze Close, Tetbury, Glos. (L.)

Nisbet, K. J. (1820), Invergarry, Madeira Walk, Church Stretton, Shropshire. (L., P. of insects)

Norman, Dr. T. (68), Seleng T.E., Seleng Hat P.O., Upper Assam, India. (H., L., D., parasites of L.)

Northern Naturalists' Club (1828†), 80 Fonthill Rd., Aberdeen. Com. to Hon. Sec. J. B. Coutts.

Nott, J. C. (1913), 1 Buckleigh Ave., Merton Park, London S.W.20. (L.)

Odell, B. J. (2054*), 30 Allandale Crescent, Potters Bar, Middx. (L.)

Ogden, J. B. (1580), Willow House, Cote Hill, Burnley Rd., Halifax, Yorks. (L., Genetics)

Ogden, J. S. (1070), Plas-yr-ywen, Cefn Coed, nr. Methyr Tydfil, Glam. (L., C.)

Oliver, S. F. (2236), 31 Dean's Rd., London W.7. (L., gen. ent.)

Ollevant, D. (1514), 3 Salcombe Drive, Morden, Surrey. (L.)

Otter, G. W. (475), Southwood, Blandford Rd., Broadstone, Dorset. (L., C., T.)

Ottewell, B. (1856*), 100 Scalford Rd., Melton Mowbray, Leics. (L.)

Owen, D R. (2230*), 337 Crystal Palace Rd., London S.E.22.

Owers, D. E. (1319), 114 Demesne Rd., Wallington, Surrey. (L., C., O.)

Page, E. S. (598), The Gables, Cookham Dean, Berks. (L.)

Page, R. O. M. (2068), County of Stafford Training College, nr. Stafford. (B.)

Painter, S. A. A. (2274*), 54 Norbroke St., London W.12. (NH., P., gen. ent. esp. exot. R.)

Pallister, S. (2294), Royal Grammar School, Newcastle-upon-Tyne 2. (gen. ent.)

Palmer, B. J. (2172), 71 Coburg Rd., Dorchester, Dorset. (H., L., D. esp. Tachinidae)

Palmer, J. L. (900), "Trethias," Lidden, Penzance, Cornwall. (Organisation of entomological and phenological returns)

Parker, H. (738), 21 Park Way, Southwick, Sussex. (gen. ent., NH.)

Parker, R. A. B. (1535), 63 Rainham Rd., Gillingham, Kent. (aq. ent.)

Parmenter, L., F.R.E.S., (895), 94 Fairlands Ave., Thornton Heath, Surrey. (D.)

Parrett, F. I. (1993), 3 Garden Close, Banstead, Surrey. (R.)

Parrett, M. (1991*), 3 Garden Close, Banstead, Surrey. (R.)

Parrott, N. R. (2182*), 34 St. Mark St., Gloucester. (C., R.)

Parry, D. E. (1916), 15 Warwick Rd., Southampton, Hants. (L., C.)

Parsons, R. E. R., F.R.E.S. (1512), Woodlands Lodge, Woodlands Close, Ottershaw, Surrey. (L.)

Payne, Miss D. A. (1902), The Broadway House, Llandrindod Wells, Radnorshire. (gen. ent.)

Peacey, A. F. (2170), Hillside, Brimscombe, Stroud, Glos. (T., N., ML.)
Pearce, Rev. E. J., M.A. (796), St. Teilo's Priory, Church Terrace, Roath, Cardiff. (C. esp. Haliplidae, Pselaphidae, distribution)
Pearson, E. J. W. (2193), 116 Ernest Rd., Portsmouth, Hants. (L.)
Pearson, P. D. (2051*), Brierlea, Stream Rd., Kingswinford, Staffs. (O.)
Peel, D. H. (1218), 7 Bushway, Dagenham, Essex. (R. British and exot.)
Pegg, C. A. S. (1994*), Brooklands, Langport, Som. (L., O.)
Pelham, J. (2171*), 5 King's Ave., Chichester, Sussex. (H. esp. Aculeata)
Pennington, T. H. (2315*), 4 Sea View, Scotforth Rd., Lancaster. (L., H., mic., aq.)
Penrose, R. J. (1467), 86 Mildred Ave., Watford, Herts. (L.)
Percy, A. A. (1763), Bourock, Dunlop, Kilmarnock, Ayrshire. (agric. ent.)
Pereira, E. A. (2064*), Ladyham, Burford, Oxon. (L., bees)
Perrins, C. M. (1133*), Thursday Cottage, Ember Lane, Esher, Surrey. (L.)
Petty, George R. (1113), 106 King's Rd., Rayners Lane, Harrow, Middx. (gen. ent.)
Phillips, J. W. (2108*), 49 Moreton End Lane, Harpenden, Herts. (L.)
Philp, E. G. (2165), 80 Boxley Rd., Maidstone, Kent. (gen. ent., esp. L.)
Pickard-Cambridge, D. F. (2052), Box 53 Beaufort West, Cape Province, S. Africa. (C., O., Phasmidae)
Pickering, E. C. (1243), 31 Alexandra Drive, Surbiton, Surrey. (H.)
Pickett, A. H., L.D.S., D.M.D. (37), 32a Chatsworth Rd., Brighton, Sussex. (L.)
Pieris, S. (2289), c/o Agricultural Dept., Nicosia, Cyprus. (gen. ent.)
Pilcher, T. F. (1914), "Bramacre," Stevenage Rd., Knebworth, Herts. (Silkmoths)
Platts, J. H. (515), Lawn Cottage, Sway Rd., Brockenhurst, Hants. (L.)
Podmore, Miss J. S. (1607*), 23 King's Close, Wilmslow, Cheshire. (gen. ent.)
Pontin, A. J. (1670), 15 Southdale Rd., Summertown, Oxford. (L., O., C., genetics)
Pook, J. (1596*), The Gate, Stroud Farm Rd., Holyport, nr. Maidenhead, Berks. (L.)
Poole, K. H. (133), 55 The Boulevard, Weston-super-Mare, Somerset. (L.)
Poole, T. B. (1681), 19 Lynton Ave., Toller Lane, Bradford, Yorks. (gen. ent., H. Aculeata)
Porter, D. I. (1759), 83 Pasture Rd., North Wembley, Middx. (L., ornith.)
Pow, A. (39), 5 Dakers Place, Hawick, Roxburghshire. (L.)
Poyser, Miss E. (2147*), Westfield House, Middle Handley, nr. Sheffield, Yorks. (L.)
Pratt, C. B. (784), 1 West Ham Lane, London E.15. (L.)
Pratt, P. W. (1908), 49 Beale St., Dunstable, Beds. (L.)
Preston, D. (2085*), 35 Mount Pleasant, New Penshaw, Houghton-le-Spring, Co. Durham (gen. ent., B.)
Preston, J. (2224*), 21 Whitelock St., North St., Leeds. (L.)
Price, L. (1478), "Springdale," Rodborough Ave., Stroud, Glos. (L., C.)
Pringle, J. P. S. (2094), 42 Aldenham Ave., Radlett, Herts. (L., H., D.)
Prior, J. G. (2031), 7 Coates Place, Edinburgh. (L. esp. H.)
Prosser, P. J. (2141), Amber Valley School, Wooley Moor, Derbyshire. (Insect E. of carrion, esp. C., and D.)
Purvis, L. E. (941), "One Oak," Hale Rd., Hale Barns, Cheshire. (L.)
Putnam, C. D. (1383), 14 Maids Causeway, Cambridge. (gen. ent.)
Pym, P. E. E. (2196), Fernlands, Naphill Common, High Wycombe, Bucks. (L., C., O., gen. B.)
Quainton, J. T. (2074*), 58 Chester Way, London, S.E.11. (R.)
Quin, S. P. (2304*), 42 The Highlands, Edgware, Middx. (L.)
Rae, A. G., B.Sc., M.R.C.V.S. (1789), Aberure, Boroughbridge, York. (L.)
Ramsay, F. J. (837), Old Manse, Kilbarchan, Renfrewshire. (gen. ent.)
Ramsden, E. (130), 2 Temple Rd., Bishopthorpe, York. (L.)

Ranby House School (1941†), Retford, Notts. Comms. to: W. J. Adlen. (gen. ent.)
Randall, M. C. (535), 64 Mount Pleasant Rd., Chigwell, Essex. (L.)
Ranger, J. E. A. (1002), 54 Cherry Crescent, Brentford, Middx. (L., Locusts)
Ransom, D. P., M.A., A.M.I. Mech.E. (2135), 16 Belmont Rd., Bushey, Herts. (L.)
Raven, Leslie (135), 196 Gulson Rd., Coventry, Warwickshire. (L.)
Rawlinson, D. J. (2008*), 11 Lynton Ave., Harborough Rd. North, Kingsthorpe, Northampton. (L.)
Raybould, J. N. (1302), 8 Ember Farm Ave., E. Molesey, Surrey. (gen. ent.)
Rayner, A. (1818*), "Evans House," Sedbergh School, Sedbergh, Yorks. (gen. ent.)
Rayner, P. (1998*), Raecroft, Church Lane, Mersham, nr. Ashford, Kent. (C., D., breeding L.)
Read, E. C. (855), Stoney Corner, Meopham, Kent. (NH.)
Read, F. D. B. (1721*), Pease Close, Throwleigh, nr. Okehampton, Devon. (L.)
Read, Miss M. J. L. (1686*), Hawthorn, Longfield Ave., New Barn, Longfield, Kent. (gen. ent., NH.)
Read, P. D. (2181*), 18 Oxenpark Ave., Preston Rd., Wembley, Middx. (L., Orth., C.)
Redgrave, A. C. R. (1639), Hartsdown, Glenfield Ave., Bitterne, Southampton, Hants. (L., ML.)
Reed, D. M. (2202*), 38 Estcourt Rd., Gloucester. (L., C.)
Reid, J. F. (1821), 19 High Street. Leighton Buzzard, Beds. (L.)
Relf, C. E. (2280), Pinecroft, Cippenham Lane, Slough, Bucks. (L.)
Renfrew, C. (1507), Lanhill, Bourton-on-the-Water, Glos. (L., gen. ent.)
Richardson, Austin (483), Beaudesert Park, Minchinhampton, Glos. (L.)
Richardson, N. A. (431), 1 The Crescent, Haversham, Bucks. (L.)
Rickard, R. M (1341), Post Office, Coningsby, Lincoln. (L.)
Riley, H. (1819), Great Moulton, Norwich, Norfolk. (gen. ent., Bot.)
Riley, J. J. (2306), 92 Tamworth Lane, Mitcham, Surrey. (L.)
Ritchie, J. Y. (1973), 21 Clinpy Rd., Forth, Lanark.
Ritson, William (1112), 12 West St., Winwick Rd., Warrington, Lancs. (ornith., gen. ent., esp. C., Orth.)
Rivers, C. F. (1443), c/o Agricultural Research Council, Plant Virus Unit, Molteno Inst., Cambridge. (L.)
Roberts, S. F. (216), 66 Hoads Wood Rd., Hastings, Sussex. (C.)
Roberts, W. N., B.Sc. (Econ.), F.R.Econ.S. (77), 12 Laburnum Grove, New Malden, Surrey. (L., gen. ent.)
Robertson, A. W. (323), "Ranworth," St. Lawrence Drive, Eastcote, Middx. (E.)
Robinson, Cyril A. (1085), 155 Regent St., Kettering, Northants. (L., C., O.)
Robinson, H. S. (1518), Lower Faringdon, Alton, Hants. (L.)
Robson, J. P. (44), 10 Vane Rd., Barnard Castle, Co. Durham. (L., ML.)
Rogers, J. W. (2237), The Cottage, Goodeve Rd., Sneyd Park, Bristol. (C., stored products insects)
Rogers, G. B. (2223), (584321 Cpl.) 3 Wing, Cpls. Club, R.A.F. Yatesbury, Calne, Wilts. (L., NH.)
Rogers, P. J. (2049), 23a Girdlers Rd., West Kensington, W.14. (L.)
Rogerson, P. G. (2109*), Barningham House, Bury St. Edmunds, Suffolk. (L.)
Rogerson, S. (1398), 10 Shelley Ave., Sutton Trust Estate, Hull. (L.)
Rollo, D. G. (1996*), Pleasant Hill, 57 Kings Rd., Berkhamsted, Herts. (L. esp. larvae)
Rooker, H. J. (1650), "Birchfield," Weeping Cross, Stafford. (gen. ent., ornith., aq.)
Rorke, D. W. (2168*), 294 Soutter St., Pretoria West, Pretoria, S. Africa. (L., C., N., Mantidae)
Rosamond, P. (2246), 4 Great Northern St., Huntingdon. (L.)
Rossner, S/L A. (1611), 14 Anglesey Gdns., Carshalton Beeches, Surrey. (L.)
Rothschild, G. H. (2002*), 20 Redford Ave., Wallington, Surrey. (gen. ent.)
Roudier, A. J. (1294), 6 Square Georges Lesage, Paris 12e, France. (C., L.)
Row, Capt. A. W. H. (1316), 18 Macaulay, Widcombe Hill, Bath, Som. (L., R. of the World, gen. ent.)
Rowden, A. O. (405), Rydon Crest, Countess Wear, Exeter, Devon. (gen. ent.)

Rowell, C. H. F. (1865), 4 North Lane, Elwick, West Hartlepool, Co. Durham. (L., H., N.)

Rozier, R. L. (2/Lt.) (2176), 17 Mitchell Ave., Chatham, Kent. (gen. ent. tropical insects)

Rudland, W. L., F.R.E.S. (249), 436 Hythe Rd., Ashford, Kent. (L., ML., H.)

Rumsby, Miss B. M. (2307), 225 The Causeway, Petersfield, Hants.

Rumsey, F. W. (1886), 46 Warren Rd., Banstead, Surrey. (L.)

Russell, S. G. Castle (119), 5 Bridge Rd., Cranleigh, Surrey. (R. vars.)

Russell, W. E. (1525), 547 Fulbridge Rd., Werrington, Peterborough, Northants. (L.)

Rutherford Grammar School (Boys) (1830†), Newcastle-on-Tyne. Com. to W. W. L. Halkier. (gen. ent.)

Ruthven, D. J. (1780*), " Mayfield," North Walsham Rd., Sprowston, Norwich, Norfolk. (gen. ent.)

Rutty, T. J. (2114*), 2 Station Rd., Maldon, Essex. (Endopterygota)

St Edward's School (1405†), Oxford. Com. to A. M. Emmet, M.A. (gen. ent.)

Salim, M. (2179), Agricultural Research Station, Ministry of Agriculture, Amman, Jordan.

Sandy, D. G. (1785), 26 Thorneyfields Lane, Stafford. (C., L.)

Sangster, D. R. (578), 69 Leadside Rd., Aberdeen. (L.)

Sargent, H. B. (1189), 8 Bay View Terrace, Porthleven, Cornwall. (breeding L., Bot. of county)

Saundby, Air Marshall Sir R., H.M.S., K.B.E., C.B., M.C., D.F.C., A.F.C., F.R.E.S. (1817), Oxleas, Burghclere, nr. Newbury, Berks. (L., local lists and museums.)

Savidge, J. P. (2041), Millwood, Spital, Wirral, Cheshire. (O., L., D., H., Hem., Orth., C.)

Scott, O. S. (1762), 15 Cromwell Rd., Boscombe East, Bournemouth, Hants. (L.)

Scott, Peter (1163), 28 Cragside Crescent, Hawksworth Estate, Leeds 5.

Scott, R. J. (2317*), " F " The Terrace, The Garrison, Shoeburyness, Essex. (L.)

Scott, W. (1403), 6 Crocketts Ave., Crocketts Rd., Birmingham 21 (R.)

Scott-Taggart, M. J. (2286*), The Old House, Northcourt, Abingdon, Berks. (L., Formicoidea)

Seago, J. H. (1466), Ash Tree Cottage, 105 Racecourse Rd., Swinton, nr. Mexborough, Yorkshire. (L.)

Searle, H. R. (1926), 17 Agnes Ave., Leigh-on-Sea, Essex. (H.)

Shapland, J. D. (548), Foamite Ltd., 235-241 Regent Street, London W.1 (L., mic.)

Shaw, H. K. Airy, B.A., F.L.S., F.R.E.S. (545), Christian Fellowship Centre, 13 Honor Oak Rd., S.E.23. (Orth., Het., C., E., Bot., NH. Socs.)

Shaw, J. P. (1204), The Mental Hospital, Weyburn, Sask., Canada (L.)

Shaw, M. W. (911), Dept. of Advisory Entomology, Marischal College, Aberdeen. (gen. agri. ent. esp. Fruit pests)

Shaw, R. G. (1486), 5 Burnham Rd., London E.4. (L.)

Sheppard, P. M. (291), Dept. of Zoology and Comparative Anatomy, University Museum, Oxford. (L., gen. ent.)

Shield, Donald H. (1156), The Hall, Badwell Ash, Bury St. Edmunds, Suffolk. (L.)

Showler, A. J. (1442), 19 Harvel Crescent, London S.E.2. (L.)

Side, K. C. (2140), 107 London Rd., Stone, nr. Dartford, Kent. (gen. ent., C., D.)

Siggs, L. W. (243), 10 Repton Road, Orpington, Kent. (L.)

Sills, P. (2173), 67 Heygate Ave., Southend-on-Sea, Essex. (gen. ent. esp. L.)

Simmonds, S. P., B.Sc., M.I.Biol. (2009), 49 Iveson Approach, Leeds, 6, Yorks. (Het. C., Thysanoptera, Aphidae)

Skidmore, P. (1705), 240 Grains Rd., Shaw, Lancs. (L., C.)

Skillen, S., M.Sc. (2104), 29 Ormonde Park, Finaghy, Belfast, N. Ireland. (gen. insect B., esp. as aid to teaching NH., B., ornith.)

Sladen, P. A. (2058*), 79 Dell Rd., King's Norton, Birmingham 30. (L.)

Slatter, A. J. (131), Public Health Dept., Port Moresby, Papua.

Smart, P. E. (2293*), 69a Cleveland Rd., London, E.18. (NH, gen. ent. L.)

Smith, A. E. (2053*), 12 Hawes Mount, Little Horton, Bradford, Yorks. (L.)

Smith, D. J. (1324), 16 Roylesden Crescent, Chester Rd. North, Sutton Coldfield, nr. Birmingham. (L., C., D.)

Smith, D. S. (1755), 87 Willingdon Rd., Eastbourne, Sussex. (L., C.)

Smith, E. K. (178), 13 Salisbury Rd., Andover, Hants. (L., veterinary ent.)

Smith, E. W. (1207), 93 Craithie Rd., Town Moor, Doncaster, Yorks. (L.)

Smith, F. G. (2254), Shemstone Lodge, Cokes Lane, Chalfont St. Giles, Bucks. (L., C., D., gen. ent.)

Smith, J. S. (1863*), The Mount Cottage, The Mount, Shrewsbury, Salop.

Smith, Kenneth, G. V., M.I.Biol., F.R.E.S. (897), Horwood Hall, University College of North Staffs., Keele, Staffs. (D., gen. and econ. ent., N.H., B.)

Smith, K. J. (1289*), 21 The Mount, Cheylesmore, Coventry, Warks. (L.)

Smith, M. G. (2177*), 2 Corringham Rd., Wembley Park, Middx. (Orth., L., C.)

Smith, P. Siviter (250), 21 Melville Hall, Holly Rd., Birmingham 16. (L., P.)

Smith, R. V. F. (2313*), Lucerne, Market Place, Swaffham, Norfolk. (L.)

Smith, S. F. (1849), 69 Standard Ave., Coventry. (L.)

Smith, S. Gordon, F.L.S., F.R.E.S. (478), Estyn, Boughton, Chester. (L.)

Smith, T. H. W. (1462), 13 Oxford St., Rugby, Warks (L.)

Smith, W. R. (1641), 105 King Edward Ave., Southampton. (L.)

Snell, B. B. (419), Woodsome, Plymyard Ave., Bromborough, Cheshire. (L., ML.)

Southville Boys' Insect Club, The (1567†), Southville Secondary School, Ashton Gate, Bristol 3. Com. to G. E. Lovell. (L. esp. Silkmoths)

Southwood, T. R. E., F.R.E.S. (1051), Parrock Manor, Old Road East, Gravesend, Kent. (Het., C., E.)

Spearman, R. I. C., B.Sc., M.I.Biol. (921), Oaks Bungalow, Oaks Ave., London, S.E.19. (B., NH, social insects)

Sperry, J. L. (1434), 3260 Redwood Drive, Riverside, California, U.S.A. (L.)

Spink, G. Frederick (1356), 237 Leigham Court Rd., London S.W.16. (C.)

Spittles, C. E. (1483), 95 Tring Rd., Aylesbury, Bucks. (L.)

Stafford Training College, The County of (1646†), Nelson Hall, nr. Stafford.

Stallwood, B. R. (1547), 19 Southfield Gdns., Strawberry Hill, Twickenham, Middx. (L., O.)

Steel, J. B. (2162*), 6 The Gardens, Rayners Lane, Pinner, Middx. (L.)

Stewart, J. B. M. (2150*), 26 Brendon Way, Bush Hill Park, Enfield, Middx. (gen. ent.)

Stidston, Eng. Capt. Stanley T., R.N., J.P., F.R.E.S., M.S.B.E. (40), "Ashe," Ashburton, Newton Abbot, Devon. (L.)

Stoddart, R. W. (2308), 26 Owston Rd., Carcroft, Doncaster, Yorks.

Stokes, Capt. G. E. (319), 10 Milton Ave., Clitheroe, Lancs. (L.)

Storer, Miss N. C. (2231), Milton Lodge School, Wells, Som. (genetics, esp. of R.)

Storey, W. H. (277), Fairstead, Long Rd., Cambridge. (L.)

Stow, A. F. (2320*), 28 Murray Rd., Rugby, Warks. (L.)

Stradling, D. J. (2146*), 25 Kings Drive, Bishopston, Bristol 7. (L.)

Strainge, A. F. (2130), 3 Rivington Court, Harlesden Rd., London, N.W.10. (L., gen. ent.)

Streeter, D. T. (2200*), 193 London Rd., East Grinstead, Sussex. (ent. in Limnology, L.)

Stroud, R. W. (1911*), 12 Sheridan Terrace, Whitton Ave. West, Northolt Park, Greenford, Middx. (L., O.)

Sturdy, D. A., B.Sc. (988), Oak Cottage, Bannister Green, Felstead, Dunmow, Essex. (D., O., agric. ent.)

Sudlow, M. (2260*), 106 Worcester Rd., Marton, Blackpool, Lancs. (L.)

Suffield, N. L. (1157), Eureka, Seaham Rd., Dalton-le-Dale, Murton, Co. Durham. (gen. ent.)

Sutton, F. R. (538), 42 Fairfield Drive, London S.W.18. (L.)

Sutton, G. R. (237), 6 Kenilworth Gdns., Loughton, Essex.

Swain, A. M (1409), 253 Crescent Drive, Petts Wood, Kent. (L.)

Swain, H. D., M.A., F.R.E.S. (1800), 47 Dryburgh Rd., London, S.W.15. (L., H., C., Hem.)

Swan, C. T. (2299*), 26 Tuffley Ave., Gloucester. (L., C.)

Swan, J. M. A. (2178*), Dubergy Cottage, Ravensdale, Dundalk, Co. Louth, Eire. (gen. ent., L.)

Swanepoel, D. A. (2244), c/o Clovelly Country Club, P.O. Kalkbay, Cape Town, S. Africa. (L.)

Swann, E. L. (882), 282 Wootton Rd., King's Lynn, Norfolk. (Bot., C.)

Swansborough, M. O. (2137), 70 Bullsmoor Lane, Enfield, Middx. (L., C.)

Syms, E. E., F.R.E.S. (406‡), 22 Woodlands Ave., London E.11. (P., gen. ent., breeding)

Tagg, D. A. (2249), 82 High St., Hampton Hill, Middx.

Taher, S. (2316), P.O.B. 226, Amman, Jordan.

Tailby, S. R., B.Sc., A.R.I.C. (636), 33 Alexandra Drive, Surbiton, Surrey. (L.)

Tailby, T. W. (1975), 56 Edgehill Rd., Leicester. (gen. ent.)

Talbot de Malahide, Lord (384), Malahide Castle, Dublin, Ireland (L.)

Tams, W. H. T., ‡, Dept. of Entomology, British Museum (Nat. Hist.), London S.W.7. (L., P., Arachnida)

Tanner, T. C. (1701), Ivy House, Meole Brace, Shrewsbury. (gen. ent.)

Tanton, M. T. (1890*), "Normandy," Lichfield Rd., Dunstall, Burton-on-Trent, Staffs. (L.)

Tayler, A. G. (433), Whiteshoots Hill, Bourton - on - the - Water, Cheltenham, Glos. (gen. ent.)

Taylor, A. S. (1510), 364 Burley Rd., Leeds, 4. (C., L.)

Taylor, B. F. (2151*), Flat 3, 161 Queen's Drive, London, N.4. (L., C.)

Taylor, C. J. (2055*), 47 Rawlinson Rd., Southport, Lancs. (breeding L., esp. Hawkmoths & exot.)

Taylor, G. B. (2016), 7 Candover Close, Harmondsworth, West Drayton, Middx. (L.)

Taylor, H. T. (1943), 9 Queens St., Stamford, Lincs. (R. Heterocera)

Taylor, L. R. (441), 5 The Manor, Rothamsted, Harpenden, Herts. (L.)

Taylor, M. F. (1725), 186 Holburne Rd., Blackheath, London S.E.3. (L., breeding)

Taylor, M. J. (1209), 51 Grange Rd., Kenton, Harrow, Middx. (L.)

Taylor, P. G., F.R.E.S. (719), 51 Woodlands Drive, Watford, Herts. (L., agric. pests, B., E., M., cave fauna)

Taylor, R. C. (1528), Vinnicks Cottage, Pill Hill, Highclere, nr. Newbury, Berks. (L.)

Taylor, W. T. (2305), 1 Manor Rd., Lillington, Leamington Spa, Warks. (gen. ent., L.)

Tebbs, H. F. (1897), 38 Cavendish St., Peterborough, Northants.

Tesch, L. R. (‡), King's School, Rochester, Kent. (L.)

Thom, C. F. (2080), 92 Stratford Rd., Stroud, Glos.

Thomas, B. R. (1709*), 2 Springfield Rd., Carmarthen, S. Wales. (L.)

Thompson, R. T. (1825), 1 Waterloo Rd., Salisbury, Wilts. (L.)

Thornton, J. N. (1413), 123 Otley Old Rd., Leeds 6. (L., H.)

Thorpe, H. J. (482), Perivale, Glenmore Lane, Quedgeley, Glos. (L., C., ornith.)

Todd, A. (1197), Wesley Villa, Thornley, Durham. (gen. ent.)

Tonks, F. (2240), 111 Abercrombie Ave., High Wycombe, Bucks. (C.)

Townsend, A. L. (1691), P.O. Box 276, Nakuru, Kenya Colony, E. Africa. (L.)

Tozer, D. (36), 98 Copdale Rd., Leicester. (L., C.)

Tremewan, W. G. (940), Wheal Rose, Scorrier, Redruth, Cornwall. (L.)

Tribbeck, R. A. (1322), "Weston," Titchfield Rd., Stubbington, nr. Fareham, Hants. (gen. ent., esp. C., E.)

Trought, T., M.A., F.R.E.S. (1373), c/o Dept. of Agriculture, Amman, Jordan. (L.)

Trought, T. E. T. (1480), Kawanda Research Station, P.O.B. 265, Kampala, Uganda. (L., C., D.)

Turner, H. B. (341), Malverleys, Newbury, Berks. (L.)

Turner, H. J. (696), 240 Iford Lane, Southbourne, Bournemouth. (L.)

Turner, J. W. (1401), 18 Fox Covert Rd., Werrington, Peterborough, Northants. (L.)

Tyler, P. S. (2318), 77 Stoke Poges Lane, Slough, Bucks. (Hem., C., gen. ent.)

Uffen, R. W. J. (1660), 4 Vaughan Ave., Stamford Brook, London W.6. (L.)

Ure, Malcolm (1354), 47 Markham Rd., Winton, Bournemouth, Hants. (L.)

Valletta, A., F.R.E.S. (1879), 257 Msida Street, B'Kara, Malta. (L., O., Orth.)

Vallins, F. T., F.R.E.S. (2149), 4 Tattenham Grove, Tattenham Corner, Epsom, Surrey. (Lycaenidae)

Van Den Driessche, M. (2029*), 6 Oakwood Crescent, Winchmore Hill, N.21. (L., C.)

Vardy, C. R. (1414), San Martino, Rushington Lane, Totton, Hants. (gen. ent.)

Vieujant, R. (898), 44 Avenue Georges Pètre, Brussels, Belgium. (C., H., L.)
Vigay, J. F. (1554*), 28 Tooting Bec Gdns., London S.W.16. (L.)
Vince, A. A. P. (588), 14 Church Hill, London N.21. (L., aq. C., glass-house pests)
Vincent, P. S. (2192), Pelham House, Bardwell, Bury St. Edmunds, Suffolk. (L., esp. Silkmoths, Brit. R.)
Wacher, P. B. (2006), The Deanery, Chartham, Canterbury, Kent.
Waddington, L. G. F. (169), 8 Lawn Ave., Doncaster, Yorks. (L.)
Wade, D. (1104), 17 Waldegrave Ave., Holderness Rd., Hull, Yorks. (L., breeding, ornith.)
Wager, J. R. (181), 62 Whateley Crescent, Castle Bromwich, Warks. (L., esp. R.)
Wakely, S. H. (1860), 26 Finsen Rd., Ruskin Park, S.E.5. (L., D., H.)
Walding, H. J. (1673), 48 Freehold St., Northampton. (gen. ent.)
Walker, D. (2056*), 37 Wallace Rd., Loughborough, Leics. (L.)
Walker, G. T. (1737), Manor House, Whitewell, nr. Worksop, Notts. (L.)
Walker, Miss J. M. (2267), Flatford Mill, East Bergholt, nr. Colchester, Essex. (Symphyta, Hem.)
Walker, P. A. (1968*), Flat 3, Stanford Park, nr. Loughborough, Leics. (C., H., aq. ent.)
Wall, G. (554), Hafod, Merstham, Surrey. (L., C., ornith.)
Wallis, B. M. (1832), 72 The Downs, Altrincham, Cheshire. (L.)
Walsh, G. B., B.Sc. (24), 22 Stepney Drive, Scarborough, Yorks. (C., B., Hem.)
Walshe, Lt. Comdr. P. la B. (1834), First Floor Flat, 69 Hitchen Hatch Lane, Sevenoaks, Kent. (L.)
Walter, P. W. R. (1493*), 190 Carrhouse Rd., Hyde Park, Doncaster, Yorks. (L.)
Walton, A. M. (426), 275 Croxted Rd., London S.E.21. (L.)
Walz, F. H. (2139), Reconquista 453, Buenos Aires, Argentine.
Wanstall, P. J. (465), 54 Matlock Rd., Brighton 5, Sussex. (R., Mosquitoes)
Ward, E. A. J. (709), 6 High St. Swanage, Dorset. (L.)
Ward, J. P. C. (1440), 8 Neal Ave., Southall, Middx. (L.)
Ward, K. E. (1680*), 129 Strouden Rd., Winton, Bournemouth, Hants. (L.)
Warterson, E. (2303), 67 Front St., Pity Me, Co. Durham. (L.)
Warwick County Museum (1773†), The Market Place, Warwick. Com. to the Curator.
Warwick, Dr. R., B.Sc., Ch.B. (1823), Medical School, University of Manchester, Manchester 13. (L.)
Washington, R. (1766), Lynwood, Highfield Second Ave., Stockton Brook, Staffs. (L.)
Watkins, S. S. A., A.C.G.I., B.Sc., M.I.E.E. (1728), 60 Station Rd., Birchington, Kent. (L., D.)
Watson, J. J. S. (2314*), 22 Hatley Close, London N.11.
Watson, R. W. (752), 15 Halstead Rd., Bittern, Southampton. (L.)
Watson, Dr. T. T. B. (1735), 58 Oxford Gdns., London W.10. (L., Silkmoths).
Watson, W. A. (1757), Leach Farm, Division Lane, St Annes-on-Sea, Lancs. (gen. ent. esp. Moths)
Watts, W. J. (240), Glaslie, First Ave., Stanford-le-Hope, Essex.
Waugh, R. M. (845), c/o Simpson, 26 Mayfield Ave., Dalton, Huddersfield, Yorks. (gen. ent. esp. L.)
Weaving, W. (1930), 27 Agnes Ave., Leigh-on-Sea, Essex. (Anoplura, H. Parasitica, D.)
Webb, Harry E., F.R.E.S. (736), 20 Audley Rd., London N.W.4. (L.)
Weddell, B. W. (701), 13 The Halve, Trowbridge, Wilts. (L., ML.)
Wellington College Natural History Society (1537†), Crowthorne, Berks. Com. to C. H. Bulteal. (gen. ent.)
Welti, A., F.R.E.S. (402), 34 Great St. Helens, London E.C.3. (L.)
West, D. C. (2105*), Taiping House, Whitemill Lane, Frome, Som. (L.)
Weston, S. F. (2291), Chestnut Grove, Radcliffe-on-Trent, Notts. (L.)
Whalley, P. E. S., B.Sc. (1310), 1 Cadvan Villas, Menai Bridge, Anglesey. (Orth., E., ornith., Z.)
Whicher, L. S., F.R.E.S., A.R.Ae.S. (1345), 6 Chisholm Rd., Richmond, Surrey. (C.)
White, Miss A. (2152*), 79 Prince of Wales Mansions, London, S.W.11. (C., Hem.)
White, E. J., M.P.S., F.B.O.A., F.S.M.C. (1748), High St., Westerham, Kent. (L.)
White, G. B. (1749*), 65 Virginia Rd., Thornton Heath, Surrey. (L.)
White, K. M. (715), Blackpool Corner, Crewkerne Rd., Axminster, Devon. (H., gen. ent., bionomics)

White, O. M. (140), 78 Eastdale Rd., Nottingham. (D.)

Whitfield, L. L. (1805), 105c Station St., Birmingham 5. (L.)

Whitlock, R. N. (1900*), The Grove, Great Yeldham, Essex. (L.)

Wickes, W. D. (1658), 19 Sunridge Ave., Luton, Beds. (L.)

Wiggins, E. D. (975), Wayside, Partridge Green, Horsham, Sussex. (C. esp. iridescent Phytophaga)

Wilkin, F. J. (2134), 183 Clock House Rd., Beckenham, Kent. (L. esp. Silkmoths)

Wilkinson, W. (2037), Whinmoor, Highfield Ave., Goldthorpe, nr. Rotherham, Yorks. (C., econ. ent.)

Williams, Dr. C. B., M.A., Sc.D., F.R.E.S.‡, Entomology Dept., Rothamsted Experimental Station, Harpenden, Herts. (gen. ent., M., B.)

Willis, E. (2087), Whitmore Cottage, Carharrack, Redruth, Cornwall.

Wilson, E. A., M.A. (1777), 14 Willson Crescent, Ellesmere, Salop. (aq. ent.)

Wilson, I. O. (1479), Beechworth House, Overton, Basingstoke, Hants. (C.)

Wiltshire, C. H. E. (2098), 1 Weymouth Ave., London, W.5. (C., horticultural pests)

Windsor, F. P. (785), Woodend, Horley, Surrey. (gen. ent.)

Wood, A. C. (1543), Longcroft, Station Rd., New Waltham, nr. Grimsby, Lincs. (L., H., C.)

Wood, Lt.-Col. A. E. B. (1675), Huntly, Bishopsteignton, Devon.

Wood, E. F. (684), 18 Nursery Road, Prestwich, Lancs.

Wood, E. R. (2277), 56 Denbigh St., London, S.W.1. (gen. ent.)

Woodcock, A. J. A. (1008), 65 Rock Ave., Gillingham, Kent. (C. esp. Adephaga)

Woodman, A. R. (2175*), 50 Prince of Wales Ave., Southampton, Hants. (L.)

Woodward, R. J. (2247*), 65 Valleyfield Rd., London, S.W.16. (L.)

Wooff, W. R. (721), 9 Marshall St., Barnard Castle, Co. Durham. (B., NH., L.)

Worden, A. E. (2248), 65 Ranelagh Ave., Ravenscliffe, Idle, Bradford, Yorks. (gen. ent.)

Woudstra, Miss E. M. (1948*), 35 Cecil Ave., Queens Park, Bournemouth, Hants. (R.)

Wright, A. E. (1666*), 53 Victoria Rd., Kensington, London W.8. (L.)

Wright, A. H. (355), 74 Markham Ave., Carcroft, Doncaster, Yorks. (L.)

Wright, C. R. P. (2169*), 6 Turners Wood, Wildwood Rd., London, N.W.11.

Wright, J. (609), Lakota, Cranmore, nr. Yarmouth, I.O.W. (ornith., L., C.)

Wright, Capt. W. S., B.Sc., F.R.E.S., F.R.H.S., M.B.O.U.) (1961), Mossvale, Aghalee, Lurgan, Co. Armagh, N. Ireland. (Irish L.)

Wrigley, G. F. (2061*), 39 Manchester Rd., Shaw, nr. Oldham, Lancs. (L.)

Wyers, N. (1241), "East View," Rayner St., Horbury, nr. Wakefield, Yorks. (L., ML.)

Yates, J. N. (2262*), 58 Sedbergh Ave., South Shore, Blackpool, Lancs. (L.)

Young, N. E. (2271), 51 Burnham Gdns., Cranford, Middx. (Silkmoths)

Zealey, A. (2088*), The Moorings, Druidstone Rd., St. Mellons, Mon.

GEOGRAPHICAL KEY

The purpose of this list is to enable you to get into touch with local members, if you are moving to a new district, or for excursions or holidays. Even members not interested in the same groups must have much of general entomological interest to exchange.

BRITISH ISLES

ABERDEENSHIRE. **Aberdeen:** Lightfoot, Northern Naturalists' Club, Sangster, Shaw. **Torphins:** Miss Innes.

ANGLESEY. **Menai Bridge:** Whalley.

ANTRIM. **Belfast:** Skillen.

ARMAGH. **Lurgan:** Wright.

AYRSHIRE. **Kilmarnock:** Percy.

BEDFORDSHIRE. **Bedford:** Jeffreys, Narbeth. **Dunstable:** Barling, Pratt. **Leighton Buzzard:** Heley, Reid. **Luton:** Wickes. **Silsoe:** Jarvis.

BERWICKSHIRE. **Duns:** Long.

BERKSHIRE. **Abingdon:** Bingham, Scott-Taggart. **Didcot:** Heard. **Finchampstead:** Hyde. **Maidenhead:** Page, Pook. **Newbury:** Saundby, Taylor, Turner. **Reading:** Dolton.

Windsor: Barnard. **Wokingham:** Wellington College Natural History Society.

BUCKINGHAMSHIRE. **Aylesbury:** North, Spittles. **Chalfont St. Giles:** Smith. **Chesham:** Aldridge. **Haversham:** Richardson. **High Wycombe:** Pym, Tonks. **Langley:** Halstead. **Newport Pagnell:** Cripps. **Slough:** Billington, Relf, Tyler.

CAMBRIDGESHIRE. **Cambridge:** Ford, Gardiner, Goodman, Harrison, Putnam, Rivers, Storey. **Chatteris:** Clarke. **Fulburn:** Hartley.

CARMARTHENSHIRE. **Carmarthen:** Thomas.

CARNARVONSHIRE. **Pwllheli:** Jones.

CHESHIRE. **Altrincham:** Pervis, Wallis. **Birkenhead:** Leonard, Snell. **Cheadle:** Nathan. **Chester:** Smith, S. G. **Crewe:** Greene, J.. **Knutsford:** Fielder. **Macclesfield:** Ashmore. **Nantwich:** Boyes. **Stockport:** Appleton, Holroyd. **Wilmslow:** Miss Podmore. **Wirral:** Clarke, C. A., Clarke, M. D. A., Savidge.

CORNWALL. **Falmouth:** Gregory. **Holston:** Menneer. **Padstow:** Dexter. **Penzance:** Palmer. **Portleven:** Sargent. **Redruth:** Tremewan, Willis.

CUMBERLAND. **Abbey Town:** Allen. **Penrith:** Davidson. **Scotby:** Bailey.

DERBYSHIRE. **Bakewell:** Dale. **Chesterfield:** Bilbie, Johnson, Prosser. **Hathersage:** Higginbottom. **Youlgreave:** Greaves.

DEVONSHIRE. **Ashburton:** Kennard, Stidston. **Axminster:** Bliss, White. **Barnstaple:** Harper. Hunt. **Bideford:** Midlen. **Bishopsteignton:** Wood. **Budleigh Salterton:** Bradley. **Colyton:** Ashe. **Crediton:** Blackwell. **Exeter:** Greenslade, Jeremy, Morgan, Rowden. **Exmouth:** Exmouth Training College. **Honiton:** Finlay. **Newton Abbot:** Coleridge, Lees. **Okehampton:** Read. **Plymouth:** Hamlyn, Haynes. **South Brent:** Collier. **Tiverton:** Janes, Lyon. **Topsham:** Miss Ainsworth. **Torquay:** Dobson. **Totnes:** Bennett.

DORSETSHIRE. **Dorchester:** Dalton, Lisney, Palmer. **Portland:** Durston. **Sherborne:** Miss Graham. **Swanage:** Ward. **Weymouth:** Hodder, Morrison.

DUBLIN. **Glenageary:** Baynes. **Malahide:** Lord Malahide.

DUMFRIES. **Dumfries:** Balfour-Browne, Cunningham. **Moffat:** Gent.

DURHAM. **Barnard Castle:** Moore, Robson, Wooff. **Chester-le-Street:** Dunn, Eggleston, McCulloch, Morton. **Durham:** Todd. **Gateshead:** Harrison. **Hetton-le-Hole:** Hodgson. **Houghton-le-Spring:** The Field Club, Preston. **Newcastle:** Hammond. **Pity Me:** Waterson. **Sunderland:** Jefferson, Suffield. **West Hartlepool:** Rowell.

ESSEX. **Barking:** Jarvis. **Braintree:** Hodges. **Brentwood:** Mills. **Chelmsford:** Hurrell. **Clacton:** Austin. **Colchester:** Brown, P. C., Miss Walker. **Dagenham:** Peel. **Dovercourt:** Hart. **Dunmow:** Sturdy. **Frinton:** Loose. **Great Yeldham:** Whitlock. **Halstead:** Gaze, Moss, **Harwich:** Morgan. **Ilford:** Grimwood, Ness. **Ingatestone:** Bartrop. **Leigh-on-Sea:** Searle, Weaving. **Loughton:** Dyce, Green, Lockington, Sutton. **Maldon:** Cable, Rutty. **Romford:** Gobbett. **Shoeburyness:** Scott. **Southend:** Sills. **Stanford-le-Hope:** Watts. **Witham:** Ashcroft. **Woodford:** Chapman, Lorimer, Randall.

FIFE. **St Andrews:** Miss Jackson.

FLINT. **Caerwys:** Henstock. **Rhuddian:** Lewis.

GLAMORGANSHIRE. **Bridgend:** Guile. **Caerphilly:** Bennett. **Cardiff:** Fidler, Lewis, Pearce. **Merthyr Tidfil:** Evans, Ogden. **Rhondda:** Davies.

GLOUCESTERSHIRE. **Bristol:** Backwell, C. J., Backwell, L., Bird, Caines, Carlton Park Secondary Modern Boys' School, Damsell, Miss Davis, Fonseca, Gardiner, Hobbs, Rogers, Southfield Boys' Insect Club. Stradling. **Bourton-on-the-Water:** Renfrew, Tayler. **Coleford:** Garraway. **Gloucester:** Benfield, Dangerfield, Dixon, George, Howe, Parrott, Read, Swan, Thorpe, Herbert Hill. **Stroud:** Peacey, Price, Richardson, Thom. **Tetbury:** Newton. **Tewkesbury:** Moore.

HAMPSHIRE. **Alton:** Hinchliffe, May, Robinson. **Andover:** Smith, E. K. **Basingstoke:** Lord Wandsworth College, Wilson. **Bournemouth:** Broome, Dicker, Fraser, Mansfield, Scott, Turner, Ure, Ward, Miss Woudstra. **Brockenhurst:** Platts. **Eastleigh:** Leonard, Mason. **Fareham:** Tribbeck. **Farnborough:** Fluck, Gingell. **Fordingbridge:** Burton, **Liss:** Allen. **Lymington:** Farwell, Ham, Maggs. **Petersfield:** Miss Rumsby. **Portsmouth:** Bacon, Heppell, Langford, Peason. **Ringwood:** Mackworth - Praed. **Southampton:** Compton-Green, Hosking, Molyneaux, Parry, Redgrave, Smith, W. R., Vardy, Watson, Woodman. **Southsea:** Hunt.

HEREFORDSHIRE. **Ross:** Knight.

HERTFORDSHIRE. **Barnet:** Bradley, Howarth, Laing, Mead. **Berk-**

hamsted: Rollo. **Bishops Stortford:** Ashwell, Hick. **Bushey:** Ransom. **Harpenden:** French, Jarvis, Phillips, Taylor, Williams. **Hatfield:** Betchley. **Radlett:** Pringle. **Rickmansworth:** Lydgate-Bell. **St. Albans:** Banthorpe. **Stevenage:** Pilcher. **Tring:** Cockayne. **Ware:** Gerard, Graham. **Watford:** Bland, Clark, Fox, Penrose, Taylor. **Welwyn:** Bonar.

HUNTINGDONSHIRE. **Huntingdon:** Leeds, Rosamond.

INVERNESS. **Newtonmore:** Harper, G. W., Harper, M. W.

ISLE OF MAN. **Castletown:** Nelson.

ISLE OF WIGHT. **Yarmouth:** Wright. **Wroxhall:** Lobb.

KENT. **Ashford:** Duffield, Rayner, Rudland. **Beckenham:** Freeman, Lane, Wilkin, Muncaster. **Bexley:** Heselden, Newman. **Biddenden:** Farley. **Birchington:** Watkins. **Bromley:** Gowing-Scopes, Herbert, Idle, Little, J. C., Siggs, Swain, A. M. **Canterbury:** Wacher. **Chatham:** Greenwood, Major, Parker, Rozier, Tesch, Woodcock. **Cranbrook:** Boxall, Bull. **Dartford:** Honeybourne, Howton, Side. **Faversham:** Featherstone. **Gillingham:** Fordham. **Gravesend:** Read, Southwood. **Hawkhurst:** Chatfield. **Longfield:** Miss Read. **Maidstone:** Beaufoy, Earl, Grant, Homewood, Philp. **Sandwich:** Harle. **Sevenoaks:** Walshe. **Sidcup:** Ling. **Sittingbourne:** Goddard. **Tonbridge:** Bing, Dyer. **Waltham:** Hunt. **Westerham:** Bennett, Edwards, White.

LANARKSHIRE. **Glasgow:** Bruce, Miss Craig, Lothian. **Forth:** Ritchie.

LANCASHIRE. **Ashton:** Lomas. **Blackburn:** Bryce. **Blackpool:** Sudlow, Yates. **Bolton:** Horton-Omerod. **Bury:** Bailey. **Clitheroe:** Stokes. **Dalton-in-Furness:** Allan. **Grange-over-Sands:** Berry. **Lancaster:** Harrison, Pennington. **Liverpool:** Miss Gough. **Manchester:** Atherton, Hardman, Michaelis, Milner, Warwick. **Oldham:** Barbrook, Lees, Mills, Skidmore, Wrigley. **Prestwich:** Wood. **Rochdale:** Hardman. **St Annes-on-Sea:** Watson. **Southport:** Taylor. **Warrington:** Jeavons, Morris, Ritson.

LEICESTERSHIRE. **Leicester:** Crammer, Hanson, Tailby, Tozer. **Loughborough:** Henderson, Walker, D., Walker, P. A. **Market Harborough:** Buckler, Harris-Evans. **Melton Mowbray:** Ottewell.

LINCOLNSHIRE. **Boston:** Cooper, Miss Hopkins. **Coningsby:** Rickard. **Grimsby:** Jeffs, Wood. **Sleaford:** Haywood. **Spalding:** Cullum. **Stamford:** Taylor.

LONDON. **E.4:** Shaw. **E.7:** Baxter, L. N., Baxter, R. **E.10:** Carter, Gladdish, Morgan. **E.11:** Bazin, Syms. **E.15:** Pratt. **E.17:** Ison. **E.18:** Smart. **E.C.3:** Colman, Welti. **N.4:** Taylor. **N.7:** Larkin. **N.11:** Watson. **N.12:** Cross, Clarke. **N.16:** Lewis. **N.18:** Janes. **N.20:** Carr, Lorimer. **N.21:** Van Den Driessche, Vince. **N.W.3:** Cameron, Harrison-Gray. **N.W.4:** Webb, **N.W.8:** Ashby, Bushby. **N.W.10:** Mrs. Cooper, Gilder, Strainge. **N.W.11:** Wright. **S.E.2:** Showler. **S.E.3:** Hyatt, Kluth, Taylor. **S.E.5:** Bradley, Miss Dudding, Wakeley. **S.E.9:** Mrs. Adams, Miss Cove. **S.E.11:** Quainton. **S.E.12:** Bobe, Bruce, Fox. **S.E.16:** Ewart. **S.E.18:** Hards. **S.E.19:** Spearman. **S.E.21:** Walton. **S.E.22:** Owen. **S.E.23:** Shaw. **S.E.25:** Cornelius, Jones, Lewis. **S.E.26:** Lamb. **S.W.1:** Miss Davis, The Nature Conservancy, Wood. **S.W.2:** Miss Gibbons. **S.W.6:** Keefe. **S.W.7:** Britton, Collins, Tams. **S.W.9:** Carter. **S.W.11:** Miss White. **S.W.15:** Morris, Swain. **S.W.16:** Mrs. Blake, Blake, T. G., Spink, Vigay, Woodward. **S.W.17:** Miss Allen. **S.W.18:** Sutton. **S.W.19:** Miss Collis. **S.W.20:** Dawes, Donovan, H. J., Donovan, Huxtable, Nott. **W.1:** Gripper, Shapland. **W.2:** Drummond. **W.4:** Craig. **W.5:** Baker, Hanson, Wiltshire. **W.6:** Uffen. **W.7:** Oliver. **W.8:** Brangham, Miss Longfield, Wright. **W.10:** Watson. **W.12:** Painter. **W.14:** Rogers. **W.C.1:** Campbell, Harding.

LOUTH. **Dundalk:** Swan.

MIDDLESEX. **Bedfont:** Kindered. **Brentford:** Ranger. **Cranford:** Young. **Ealing:** Stroud, Ward. **Edgware:** Freedman. **Enfield:** Eagles, Stewart, Swansbough. **Feltham:** Classey. **Hampton:** Tagg. **Harrow:** Byerley, Coles, Filbee, Goddard, Lower School of John Lyon, Martin, Petty, Taylor. **Hayes:** Moppett. **Heston:** Gerard. **Pinner:** Evans, Gilbert, Steel. **Potters Bar:** Hague, Odell. **Ruislip:** Blackburn, Robertson. **Stanmore:** Hatcher, Hilliard, Quin. **Staines:** Hill. **Twickenham:** Crotch, Hawdon, Stallwood. **Wembley:** Giles, Porter, Read, Smith, Taylor. **West Drayton:** Taylor.

MIDLOTHIAN. **Edinburgh:** Beattie, Ewing, Finlay, Manson, Miller, Morrison, Prior.

MONMOUTHSHIRE. **Newport:** Keen. **St. Mellons:** Zealey.

NORFOLK. **Dereham:** **Durrant.** **King's Lynn:** Day, Fenn, Swann. **Norwich:** Addison, Evans, Riley, Ruthven. **Sheringham:** Johnson. **Swaffam:** Smith.

NORTHAMPTONSHIRE. **Kettering:** Robinson. **Kingsthorpe:** Rawlinson. **Northampton:** Fisher, Walding. **Peterborough:** Russell, Tebbs, Turner. **Towcester:** Humphrey. **Wellingborough:** Gent.

NORTHUMBERLAND. **Morpeth:** Halkier. **Newcastle-on-Tyne:** Benson, Burtt, Pallister, Rutherford Grammar School (Boys). **Ponteland:** Barker. **Wallsend:** Backley.

NOTTINGHAMSHIRE. **Nottingham:** Hodson, Weston, White. **Retford:** Ranby House School. **Whitewell:** Walker. **Worksop:** Brown, R. M.

OXFORDSHIRE. **Bampton:** Lloyd. **Banbury:** Gibbs. **Burford:** Pereira. **Oxford:** Barrett, Blackwell, Bureau of Animal Pop., Emmet, The Hope Professor, Martin, Pontin, St. Edward's School, Sheppard.

PEMBROKESHIRE. **Haverfordwest:** Dale Fort Field Centre.

RADNORSHIRE. **Llandrindod Wells:** Miss Payne.

RENFREWSHIRE. **Greenock:** Maclaurin. **Paisley:** McNally, Ramsay.

ROXBURGH. **Hawick:** Pow.

RUTLAND. **Uppingham:** Lofting.

SHROPSHIRE. **Church Stretton:** Nisbet. **Ellesmere:** Wilson. **Shrewsbury:** Smith, J. S., Tanner.

SOMERSETSHIRE. **Axbridge:** Hanson. **Bath:** Row. **Bridgwater:** Clatworthy, Cowley, Mid-Som. Nat. Soc. **Crewkerne:** Keylock. **Frome:** Cruttwell, West. **Langport:** Pegg. **Shepton Mallet:** Knight. **South Petherton:** Keetch. **Taunton:** Neal. **Wellington:** Archer. **Wells:** Storer. **Weston-super-Mare:** Ball, Blathwayt, Brookman, Clark, Poole.

STAFFORDSHIRE. **Burton-on-Trent:** Cornes, Crowther, Hill, Neville, Tanton. **Keele:** Smith. **Kingswinford:** Pearson. **Old Hill:** Mason. **Stafford:** The County Training College, Page, Rooker, Sandy. **Stockton-brook:** Washington. **Walsall:** Chilton, Holmes. **Wolverhampton:** Kearn, Long, Morris.

STIRLING. **Grangemouth:** Mabbott. **Falkirk:** Hutchison.

SUFFOLK. **Bury St. Edmunds:** Eley, Rogerson, Shield, Vincent. **Ipswich:** Beaufoy, Harding. **Stowmarket:** Chipperfield. **Woodbridge:** Garrett-Jones.

SURREY. **Ashtead:** Greenhill, Howgill. **Banstead:** Parrett, F. I., Parrett, M. **Camberley:** Knight. **Carshalton:** Booker, Groves, Rossner. **Chessington:** Mold. **Chertsey:** Parsons. **Cranleigh:** Collier, Hurst, Russell, Weller. **Croydon:** Burrows, Collins, Goatly, Parmenter, White. **Dorking:** Haynes, Juniper Hall, Kerrich. **Epsom:** Horton, James, Vallins. **Esher:** Perrins. **Ewell:** Goddard. **Farnham:** Hodgkinson. **Guildford:** Barton. **Haslemere:** Miss Gathergood. **Horley:** Windsor. **Kingston:** Conway. **Leatherhead:** Brown. **Merstham:** Wall. **Mitcham:** Bedding, Riley. **Morden:** Ollevant. **New Malden:** Roberts. **Old Coulsdon:** Britten. **Richmond:** George, Whicher. **Selsdon:** Barnett. **Surbiton:** Austin, Burton, Durrant, Le Masurier, Pickering, Raybould, Tailby. **Sutton:** Currie, Darling, Davies, Gates, Hyde-Wyatt, Rumsey. **Wallington:** Christie, Collyer, Owers, Rothchild. **Weybridge:** Best. **Woking:** de Worms, Hellings. **Worcester Park:** Churchill.

SUSSEX. **Bexhill:** de Whalley. **Brighton:** Banner, Barker, Cribb, Durham, Dyson, Eade, Goodbody, Parker, Pickett, Wanstall. **Chichester:** Pelham. **Crawley:** Blake. **Ditchling:** Knight. **Eastbourne:** Smith, D. S. **East Grinstead:** Streeter. **Ferring:** Edwards. **Hassocks:** Cribb. **Hastings:** Chitty, Dannreuther, Roberts. **Haywards Heath:** Edelsten, Floyd, Levett. **Heathfield:** Crisp, Hitchens. **Horsham:** Wiggins. **Lewes:** Humphrey. **Newhaven:** Bickerstaff. **Polegate:** Chandless. **Shoreham:** Manning. **Worthing:** Menzies.

TIPPERARY. **Clonmel:** Murray.

WARWICKSHIRE. **Birmingham:** Bridgen, Capers, Dixon, Golby, Hammond, Hands, A., Hands, R. W., King's Norton School, Manly, Scott, Sladen, Smith, P. S., Wager, Whitfield. **Coventry:** Raven, Smith, K. J., Smith, S. F. **Leamington:** Taylor. **Rugby:** Cave, Claridge, Daltry, Davis, Kennard, Smith, T. H. W., Stow. **Warwick:** Warwick County Museum.

WESTMORLAND. **Kirby Lonsdale:** Hall.

WILTSHIRE. **Calne:** Ewing, Rogers. **Corsham:** Desmares. **Melksham:** Baker. **Salisbury:** Thompson. **Trowbridge:** Weddell.

WORCESTERSHIRE. **Pershore:** Friday. **Redditch:** Jeffries.

YORKSHIRE. **Barnsley:** Atkinson, Lees. **Barnoldswick:** Morgan. **Boroughbridge:** Rae. **Bradford:** Briggs, Haxby, Hewson, Mitchell, Poole, Smith, A. E., Worden. **Dewsbury:** Grace. **Doncaster:** Hyde, Smith, E. W., Stoddart, Waddington, Walter, Wright. **Guisborough:** Calvert, Horner, Newson. **Halifax:** Collinson, Ogden. **Harome:** Cook. **Harrogate:** Jesper. **Huddersfield:** Buck-

ley, Hanson, Waugh. **Hull:** Bilton, Kenington, Rogerson, Wade. **Ilkley:** Miss Bartle. **Kirk Ella:** Dibb. **Leeds:** Anderson, Barham, Kennedy, La Touche, Preston, Scott, Simmonds, Taylor, Thornton. **Mexborough:** Seago. **Normanton:** Kirkham. **Rotherham:** Wilkinson. **Scarborough:** Walsh. **Sedbergh:** Rayner. **Selby:** Jackson. **Settle:** Malham Tarn Field Centre. **Sheffield:** Burton, Ford, Marsden, Miss Poyser. **Wakefield:** Wyers. **Withernsea:** Harding. **York:** Bootham School Nat. His. Club, Ramsden.

OVERSEAS

ARGENTINE. **Buenos Aires:** Walz.

AUSTRALIA. **N.S.W., Sydney:** Australian Branch A.E.S. **N. Queensland, Charters Towers:** Allen. **W.A., Freemantle:** Baker. **Victoria, Melbourne:** Crosby.

BELGIUM. **Brussels:** Vieujant. **Liége:** Le Clercq.

BRITISH CAMEROONS. **Mamfe:** Miss Ika.

CANADA. **Quebec:** Aubé. **Saskatchewan:** Shaw.

CENTRAL AFRICA. **Nyasaland:** Gray.

CYPRUS. **Nicosia:** Pieris.

FRANCE. **Jouy-en-Josas:** Broughton. **Nord, Lille:** Millon. **Paris:** Roudier.

GERMANY. **Hannover:** Hesselbath.

HAWAII. **Honolulu:** Krauss.

INDIA. **Upper Assam:** Norman.

JORDAN. Mrs Graham, Salim, Taher, Trought.

KENYA COLONY. **Nairobi:** Bell. **Nakuru:** Townsend.

MALAYA. **Penang:** Myatt.

MALTA. **B'Kara:** Valletta.

NEW ZEALAND. **Wellington:** Gibbs.

N. RHODESIA. **Petauke:** Henniker-Heaton.

PAPUA. **Port Moresby:** Slatter.

S. AFRICA. **Cape Town:** Kettlewell, Swanepoel. **Cape Province:** Pickard-Cambridge. **Johannesburg:** Capener. **Natal:** Boyce. **Pretoria:** Rorke. **Zululand:** Miss Deacon. Newton.

S. RHODESIA. **Mazoe:** Cornes.

SUDAN. **Hassa Heissa:** Hudson.

UGANDA. **Kampala:** Trought, T. E. T.

U.S.A. **California:** Combs, Sperry. **Illinois:** Irwin. **Louisiana:** Isbill. **Michigan:** Mrs Hynes. **New York:** American Museum of Nat. Hist., Keji. **N. Carolina:** Butler. **Ohio:** Ferguson. **Pennsylvania:** Murchie. **Washington D.C.:** Boettcher.

AES ADVISORY PANEL

Return Postage—The only requirement of members for the use of the Advisory Panel is that they must enclose stamps to cover cost of return of specimens, or stamped envelope for reply. Otherwise, reply cannot be guaranteed. It will also be of assistance if the membership number of each enquirer is quoted in all enquiries. Unless otherwise stated, advice is only given on the fauna of the British Isles. Enquirers must remember that Advisers are busy people: dead material should be sent during the winter months when evenings are less likely to be occupied with collecting or mounting their own captures. Where large numbers of specimens are to be named, the enquirer should preferably have this done at a Museum, where paid officials are employed to deal with such enquiries. A personal visit, moreover, will usually solicit more information than would be obtained by correspondence.

Labelling—Details of locality, foodplant, date, time and mode of capture and many other details are often essential to identification. All specimens should be labelled with such data, preferably placed on a small card on the same pin as the insect. In all cases details of locality will be treated as confidential.

New Advisers—There are still many subjects not yet covered by the Panel, and volunteers to assist in these departments are much desired. Offers should be sent to D. Ollevant, 3 Salcombe Drive, Morden, Surrey.

Lepidoptera (Butterflies and Moths)

Identification of Macro larvae—Hammond, H. E. (423).

Varieties of Rhopalocera—Russell, S. G. Castle (119).

Rearing Silkmoths—Crotch, W. J. B. (1181).

Hybrid Lepidoptera — Heslop-Harrison, J. W. (716).

Distribution and local lists, Macros and Micros—Lisney, Dr. A. A. (315).

Coleoptera (Beetles)

Books and collecting methods—WALSH, G. B. (24).
Identification, other than the groups named below—TOZER, D. (36).
Elateridae, identification and advice—COOPER, B.A. (‡).
Haliplidae and Pselaphidae, identification and advice—PEARCE, Rev. E. J. (796).
Waterbeetles, identification and advice—BALFOUR-BROWNE, Prof. F. (340‡).

Hymenoptera

Parasitica, identification and advice—KERRICH, G. J. (551).

Diptera (Flies)

General identification and advice—PARMENTER, L. (895).
Immature stages, approximate identification and advice—SMITH, K. G. V. (897).
Mosquitoes, identification — CLASSEY, E. W. (41).
Conopidae, identification—SMITH, K. G. V. (897).
Larvaevoridae and Muscidae, identification—FONSECA, E. C. M. (2079).

Odonata (Dragonflies)

Identification and advice—COWLEY, J. (771).

Plecoptera (Stoneflies)

Identification and advice—SYMS, E. E. (406‡).

Neuroptera and Trichoptera

Identification and advice—PEACEY, A. F. (2170).

Hemiptera-Heteroptera (Het-bugs)

General advice and approximate identification—SHAW, H. K. AIRY (545).
Identification — SIMMONDS, P. S. (2009).

Orthoptera of the World

Identification and advice—D. K. McE. KEVAN, University of Nottingham, School of Agriculture, Sutton Bonington, Loughborough, Leics.

Insect Galls

Identification and advice—MANNING, S. A. (1774).

Arachnida (Spiders)

Identification and advice—LA TOUCHE, Dr. A. A. D. (884).

Books

General advice—SYMS, E. E. (406‡).

Microscopy

General advice — HEPPELL, D. H (1690).

Photography

General advice, not colour or cinematography—NEAL, E. G. (467).

Botany

Identification of foodplants—SHAW, H. K. AIRY (545).
Selection, propagation and cultivation of foodplants and floral attractions—DYSON, R. C. (91).

Pests

Farm and garden pests—COOPER, B.A. (‡).
Stored products pests—FREEMAN, Dr. J. A. (986).
Fruit pests—SIMMONDS, P. S. (2009).

Beekeeping

General advice—BERRY, J. E. (1072); JESPER, D. M. (1152).

Chemical Matters

General advice—HENSTOCK, Dr. H. (209).

Insect Migration

General advice—DANNREUTHER, Capt. T. (60).

Flora and Insect Fauna of Hebrides—HESLOP-HARRISON, J. W. (716).

STUDY GROUPS AND CONVENERS

Cockroaches—JOHNSON, J. H. (1840).

Diapause—HOPKINS, Miss B. A. (827).

Distribution of certain Lycaenidae (Blues)— DYSON, R. C. (91).

Distribution of Elephant Hawk—JOHNSON, J. H. (1840).

Insect Galls—MANNING, STANLEY A (1774).

Larval Colours—TAYLOR, PETER G (719).

Microscopy—ISON, C. H. (1343).

Orthoptera (habits and distribution) —MICHAEL, P. (748).

Silkmoths—SMITH, W. R. (1641).

Time of emergence from pupae—BRADLEY, P. (1360).

•

THE LIFE-CYCLE OF *CHLOROCLYSTA MIATA* LINN.

The Rev. J. H. Vine Hall's "Intriguing problem No. 2" (*Bulletin* **13**, 9) is, I suggest, susceptible to a very simple explanation, namely, that only the female sex hibernates, the males dying after mating in the autumn. *C. miata* is very common here in Inverness-shire, and *C. siterata* Hufn. not much less so, and I have been able to observe both in considerable numbers. Females are rarely seen in the autumn, entering hibernation very soon after pairing. I have found them in January under overhanging rocks covered in snow, perfectly fresh and totally inactive. The ovaries and ova develop in the spring, so that superficially with their thin bodies in the autumn the sexes are not unlike each other in the case of *C. miata*. *Dasypolia templi* Thün. is another common species here with the same habit.

Commander G. W. HARPER, R.N., F.R.E.S. (1169)

•

NAPHTHALENE HEADED PINS

A small tip that may be of use to collectors is the Naphthalene headed pin.

If an ordinary dressmaker's pin is heated in the gas or spirit lamp flame, and pressed into a naphthalene ball, the naphtha melts and the head of the pin sinks well into the ball. They can then be stuck into the cork of the cabinet or store box, in a corner or in between rows of specimens, without danger of coming loose and doing damage. I have used them for years, and it was only when a comment by a friend was made, that I realised that other collectors may appreciate the idea.

DAVID H. HEPPELL (1690).

MUGWORT—A DUAL-PURPOSE FOODPLANT

Entomologists and horticulturists in the same household do not always agree. So often a nice dock or similar useful pabulum is removed just when it is needed, unless its retention is specially requested. In the following instance, however, the two interests surprisingly did not clash. A year or so ago I was rearing *Cucullia absinthii* Linn. (Wormwood Shark) and had a little difficulty in finding the foodplant, Mugwort. With an eye to the future I scattered the seeds about the garden, knowing, or perhaps only hoping, that the plant would not become a nuisance. Since then it has come up promiscuously in odd places and been treated as other weeds. This year a fine plant appeared in a flower bed and, at my request, was not eradicated. But later I found that the long flower heads had been gathered and used for indoor decoration! In conjunction with flowers and ferns the result was most effective, and the Mugwort had the advantage that it lasted well in water and did not make a mess as the other plants did.

JOHN E. KNIGHT (94).

•

KILLING BOTTLE NOTE

On page 5 of *Bulletin*, Vol. **10**, Mr. D. H. Heppell advises the use of a specially constructed killing bottle charged with a mixture consisting of 5 cc Water, 5 cc Ethyl Acetate and 3-4 cc Ether. This, he claims, whilst being swift in despatching out victims, does not tend to cause stiffness of the wings.

Now the point of my note is this (please correct me if I am wrong, as well I may be, since my days of Chemistry Labs. is long since past!): surely a mixture containing water with Ethyl Acetate is unstable. According to my theory, the water will react with the E.A. to form Ether. and Acetic Acid. The latter being of no value as a killing agent and the former most certainly does stiffen wings and legs. Why, then, was Ether used in the mixture? Why not use just plain Ethyl Acetate absorbed into celluloid chips from which the vapour is slowly released.

In passing, I may add that a good glass-stoppered bottle, thus charged, will, if the stopper is properly ground in, last many months without recharging.

R. V. ALDRIDGE (262).

ANOTHER IDEA FOR A PUPA CAGE

Many are the notes that have from time to time been written on this subject of keeping pupae, yet many of us still fail to get certain species to emerge without a high percentage of cripples.

Mr. P. B. M. Allan, who probably knows more about breeding than most of us ever will, advocates the keeping of pupae in a well ventilated cage in a stable loft having free ingress of air via an ever open door. On this, I would not dare to question his sound judgment, nay, I, too, would keep my cages thus IF only the requisite loft were available. Unfortunately, the average detached country residence does not boast to such useful outhouses as stables.

To overcome the difficulty of keeping pupae at a reasonable humidity I have used for some time a very simple cage. This is simply a wooden box 14″×8″×9″, but any other size to suit will answer just as well. To this is fitted a glass front, sliding in grooves, fitted in a frame, of any other means you choose, provided it is pest proof. Here then, we have our cage; the floor is covered with corrugated cardboard into the grooves of which our bare pupae are placed, whilst cocoons can be placed intact wherever one chooses. A small shallow earthenware dish — you haven't an earthenware dish?—never mind use a saucer—is filled with peat which has been thoroughly soaked in water; this stands in one corner of the cage and should be rewatered from time to time.

This arrangmeent, as you have by now gathered, ensures that the inmates are kept in an atmosphere of high humidity whilst no moisture in the form of water as such, comes in contact with them. The pupal case does not become so hard that the moth is unable to free itself, neither does the pupa lose water by evaporation; in fact, they emerge in perfect condition.

For winter storage I do not advise this contraption; it may work, but I have never tried. Here I use the method which most collectors (without stable lofts) probably adopt, to wit, the keeping of pupae in tins with tightly fitting lids. Always see that the tins are deep enough to allow a moth to expand its wings, because odd specimens will emerge out of season whether you keep them indoors or out. In these tins then, my pupa spend the winter months during which time I inspect them twice a week, or more in mild spells; then each species is transferred to the emerging cage some few weeks before the estimated time of emergence. Here, Mr Allan will disagree with me and ask how I estimate the time of emergence. Well, Sir, I do my best, which, after all, is "Hobson's choice" for one not in possession of a stable loft! R. V. Aldridge (262).

OBSERVATIONS

Mr. W. Weaving (1930) writes:—I was interested in Mr. W. G. C. Booker's report (*Bull.* **12**: 91) on *Acanthomyops niger* attacked by *Pseudacteon formicarum*. I have found that these Phoridae appeared in greater numbers during July/September, i.e., when the flight period of most species of ants is occurring. When the ants are busy around their nest prior to flight the fly is very active. The ants appear to be aware of the fly, and are somewhat perturbed, and will rear up and endeavour to face their foe and open and close their mandibles. Eventually a fly will swoop in and alight on the back of the thorax, front legs on the prothorax and the ovipositor inserted under last segment in the metathorax. The position of the ant renders it difficult for the abdomen to be attacked, although it may do so, but I have not seen it done. The ovipositor is inserted immediately the fly alights, and it would appear that the nerve centre is partially affected. The fly has departed but the ant is badly shocked and it is quite a second before it seems to come to and hurries off. The fly is about 2 mm. overall, and the ovipositor, tough and broad at the base, coming by means of a deep curved scimitar to a point, takes up a third of the length.

Regarding the attraction of the smell of formic acid I am of an open mind on the point. The flies would appear to be flying around haphazardly until ants appear, and then they fly backwards and forwards in front of the ants' nest awaiting their opportunity; just two or three ants alone seem to be able to avoid attack. I have not yet seen *Formica rufa* being attacked (maybe owing to position of nests, the fly does not show up against the background), but the nest is one having the strongest smell of formic acid I have come across, and thus should have crowds of *Pseudacteon formicarum* hovering around.

I have witnessed this attacking operation in 1946-7, and 1950-2; on each occasion it was *Acanthomyops niger* being attacked. Maybe different methods of attack, and different species of ant will have been observed by other members.

LETTERS TO THE EDITOR

Dear Sir,—Little seems to have been written recently on that vexed subject of the introduction of butterflies.

The fate of *Araschnia levana* Linn., described with such delicacy by Dr. E. B. Ford, still serves to warn off would-be introducers of Lepidoptera—especially those who do not own large private estates.

Surely that incident should be to us a challenge as well as a warning. It is not my purpose to conduct a lengthy defence of the theory that "what man has destroyed—let him restore." It is essential to know the opinions of other members—those who agree and those who do not.

It is probable that if, eventually work of introduction is to be carried out on a widely organised scale—amateur entomologists might well play the most important part.—Yours faithfully,

P. S. Vincent (2192).

Dear Sir,—With reference to the letter by the Rev. E. S. Lewis (373) (*Bulletin* **13**: 15), may I say that I am extremely surprised at the last paragraph.

Your correspondent quibbles at the use of the plural by Mr. F. H. Lyon (1026) (*Bulletin* **12**: 95) in his statement that *Coenonympha tullia* ab. *philoxenus* is found on the Shropshire *Mosses*.

Mr. Lyon is quite correct in using the plural, since the insect has been taken on both Whixall Moss and Wem Moss. Wem Moss is situated south of Whixall Moss at a distance of a little over one mile. Two other Shropshire Mosses spring to mind, Pikesend Moss about three miles south of Wem Moss, and Top Moss between Wem and Hodnet. All are clearly marked on page 145 of the Road Atlas published by W. & A. K. Johnston, Ltd., of London and Edinburgh.

For a person who has known Whixall Moss for over 50 years, the Rev. E. S. Lewis seems singularly unaquainted with the surrounding countryside.—Yours truly,

Arthur F. Peacey (2170).

BOOK REVIEW

Lesser Worlds. By Nesta Pain. 244 pp., 5 black and white drawings. Longmans, Green & Co., Ltd., 1953. 10/6.

This book, which is made up of a series of essays on insect social life and behaviour, is based on a series of successful broadcasts, which in turn owe their origin to the works of the great French naturalist, J. H. Fabre. The author makes no secret of the fact that she has drawn fully on Fabre's remarkable observations and experiments, and though this results in some lack of originality, it is counteracted by the amount of information condensed in the one volume, and the fact that such eminent scientists as Dr. Bristowe and Dr. O. W. Richards have collaborated with the author.

Although the book has not been written for the entomologist, it contains much of interest concerning insect behaviour and instinct, and many of the experiments carried out by Fabre are briefly described, as well as some carried out by present-day workers.

The work is divided into five parts, dealing respectively with spiders, beetles, solitary wasps, solitary bees and ants, and is illustrated by five full-page black and white drawings by J. Yunge Bateman. It is pleasing to find the various insects and spiders referred to correctly by their generic names rather than the colloquialisms one so often has to put up with in this type of book. It would have been of interest to the layman to indicate which of the insects discussed can be found and observed in Britain. Wasps of the genera *Ammophila* and *Pompilus* and bees of the genera *Osmia* and *Halictus* can, of course, be found in this country but the pill rolling antics of *Sisyphus* and other Scarabaeid beetles are unfortunately confined to warmer climates.

There is no list of references, but in the author's acknowledgment mention is made of some of the major works on the biology of the Hymenoptera.

L. S. W.

Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. 1954.

A E S

Members can help the Society in several ways:—

(a) By dealing with advertisers and mentioning the *Bulletin.*

(b) By bringing in new members. (Subscription, 12/- per annum. Juniors, 6/- per annum.)

(c) By buying AES publications and suggesting Public Libraries should buy them.

(d) By friendly co-operation with other members.

(e) By taking just that extra bit of trouble required to record happenings of note for the *Bulletin.*

AES NOTICE

WHERE TO WRITE

Membership applications, offers of help to: D. OLLEVANT, *3 Salcombe Drive, Morden, Surrey.*

Advertisers to: L. W. SIGGS, *10 Repton Road, Orpington, Kent.*

Changes of address and non-arrival of Bulletins *to:* B. L. J. BYERLEY, *48 Elmgrove Road, Harrow, Middlesex.*

Offers to lead Field Meetings, exhibit, etc. to: K. H. BOBE, *19 Hengist Road, London, S.E.12.*

Manuscripts, drawings and books for review to: B. R. STALLWOOD, *19 Southfield Gardens, Strawberry Hill, Twickenham, Middx.*

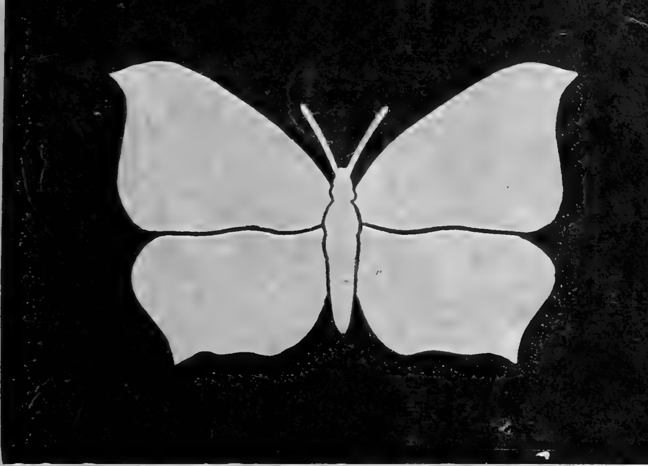
Subscriptions (12/- per annum, 6/- for Juniors) to: R. W. WATSON, *15 Halstead Road, Bittern, Southampton.*

Youth matters to: S. M. HANSON, *167 Gunnersbury Park, London, W.5.*

VOL. 13

No. 161

.Y - - 1954



THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

EDITED by B. R. STALLWOOD

A E S BULLETIN

No. 161

MAY 1954

INVESTIGATORS INVESTIGATED

We are, to the outside world, an eccentric body of people and it is inevitable that our collecting methods, weird as they frequently appear to others, should occasionally bring us into contact with "authority." The contact may be harsh (*Bull.* **7**: 190), pleasant or even amusing. As an example of the last we give our report below. Surely members can cap our experience; in fact, we know of one more tale that can be told.

In 1952 the rare Ichneumon wasp, *Eremotylus marginatus* Jurine, was found flying over the banks of the Coombe Hill canal, nr. Tewkesbury, Glos. In 1953 we decided that it would be of interest to discover if it responded to the M.V. lamp as a few other *Ophion* spp. had been taken thus in the previous weeks. The duration of the imagines' appearance is as yet unknown, recorded dates being 28.v.1916, 28.v.1930, 17.v.1952 and 23.v.1953, but we had to decide on June 3rd, no other day being available.

On the actual day the high wind and low air temperature kept us at home until almost dusk when a sharp reversal in weather conditions caused us to change our minds. At Coombe Hill the disused canal runs for half a mile westwards between two high hawthorn hedges; outside of each is a grassy strip about 15 yards wide and then another similar hedge. J. E. K. ran his car past the cottages near the canal end, down the southerly strip, and parked some 400 yards away from the cottages. Then a hundred yards of cable were let out, the lamp lit, and we waited.

A few *Ophion* came in, with a cloud of flies, several minute froghoppers, a single *Longitarsus melanocephalus* (Degeer) (Col., Chrysomelidae) (R. S. G. notes that this species has come into the sheet each time that he has used a M.V. lamp) and also the Lepidoptera listed at the end of this article. About 11 p.m. R. S. G. noticed several torches flashing around the car, 100 yards off, and where the generator was running, and a few moments later he saw two policemen advancing down the centre of the grassy strip and a dark shape in the shadows of the bank-side hedge. Then all three gave us a somewhat puzzled challenge. J. E. K. explained our behaviour, gave a short talk on M.V. lamps and the tension gradually eased off. The policemen explained that they were a mobile road patrol; headquarters had radioed instructions to them to call on a Coombe Hill man (the dark shape in the shadows) who had reported a car engine running for hours. He had seen the car go down the bank and thought that the continual throb of the engine, actually the generator, indicated a suicide, possibly even a death pact between a couple. The policemen were highly relieved to find the innocent explanation of the report and commented that they were most pleased that they had no "stiffs" to carry away. We then answered several questions on insects and collecting methods, which pleased the constables, one remarking that all this would be a help with the general knowledge paper in his next promotion examination and we parted friends.

Unfortunately, *Eremotylus* was not taken: the date may have been wrong, the weather was not good or, perhaps, it does not give a positive response to the M.V. lamp.

The Lepidoptera were:—*Pterostoma palpina* Cl. (1); *Spilosoma lubricipeda* L. (1); *Agrotis exclamationis* L. (common); *Amathes c-nigrum* L. (common); *Diarsia rubi* Vieweg. (common); *Ochropleura plecta* L. (4); *Hadena w-latinum* Hufn. (1); *H. thalassina* Hufn. (1); *H. suasa* Schiff. (common); *Phlogophora meticulosa* L. (1); *Meristis trigrammica* Hufn. (1); *Plusia chrysitis* L. (1); *P. gamma* L. (1); *Calothysanis amata* L. (1); *Triphosa dubitata* L. (1); *Electrophaës corylata* Thunb. (6); *Dysstroma truncata* Hufn. (1); *Xanthorhoë ferrugata* Cl., common, *X. montanata* Schiff. (6); *Epirrhoë alternata* Müll. (1); *Eupithecia castigata* Hb. (3); *Phlogodis dolabraria* L. (1); *Opisthograptis luteolata* L. (1); *Hepialus humuli* L. (1); *H. lupulinus* L. (1).

J. E. Knight (94)
and
R. S. George (1402).

A REMINDER

Before the end of this month *Euphydryas aurinia* Rott. (the Marsh Fritillary) will appear on the wing. Some of us are particularly interested in this species—situation of colonies, density of colonies, range of variation, incidence of parasitism and disease, fluctuation in numbers, and any other features of interest. The discovery that a phenomenal collapse occurred simultaneously in 1951 in several very widely-separated colonies gave a spur to these investigations, and we had hoped that the suggestion put forward by Mr. S. M. Hanson in *Bulletin* **12**, 42, that a study-group should be formed would meet with keen response. Unfortunately this was not the case, and only a very few reports were sent in, so no clearer picture has yet emerged than that given in my own article in the same number. One or two interesting letters were received, however, and the most fascinating report concerned a colony on an exposed and windy Cornish cliff-slope, where the food-plant grows among gorse and heather. One not infrequently finds this plant-association on dry cliff-slopes, particularly in the West, but I had never heard of a colony of *E. aurinia* in such a situation before, though its occurrence on dry chalkhills is well known. If only members would pass on their information and pool their knowledge, many interesting facts might well emerge. To appeal to members to do this is the purpose of this short reminder.

As far as the Cumberland colonies are concerned, I am glad to be able to say that there seemed to be a slight general improvement in 1953, though one colony (the one I have described as C in *Bull.* **12**, 12) again appeared to produce no specimens. Elsewhere the species is holding its ground and the beginnings of a revival appear to have begun.

J. H. Vine Hall (1520).

LOOKING BACK

I read with very much interest Mr. Maggs' contribution in *Bull.* **13**: 5.

For considerably over 50 years I have collected in the areas that he mentions, viz. the woods and downlands of the Hants, Wilts, and Dorset areas and, in addition, those of Surrey, Sussex and Berkshire. In fact I have resided for several years in succession at towns within easy reach such as Andover, Basingstoke, Fleet, Lyndhurst Road, and Winchester. It appears to me to be remarkable that I do not remember having ever met Mr. Maggs, but this may be due to defective memory. I frequently collected in the Sway and Holmesley Enclosures and especially Wooton Copse and Broadley Enclosure near Wooton, where an old-time collector much older than myself (a Mr. Dallas) could often be seen on an electrically operated cycle, from which he was unable to remove himself.

Following Mr Maggs' example I venture to give an account of my own collecting experiences which may possibly be interesting to our members.

I was born in Aldershot in August 1866, the youngest by some five years, of a family of eight boys, and of which I am the sole survivor. At the age of eight, I used to accompany several of my brothers to the woods some three miles away across the Long Valley and known as Bickley Copse. In those days these woods were not accessible to the public and were in charge of a Government Warder, one of a number serving under the Royal Engineer Department.

Here some 38 species of butterflies occurred all very abundantly. My brothers were looking for a possible *Apatura iris* Linn. but none were ever seen. Nor did we ever succeed in catching one in Alice Holt Forest near Farnham, where an heraldic crony of my father said that they occurred, but the failure was no doubt owing to want of experience and guidance, as my brothers had no entomological friends to advise them. We never saw *Limenitis camilla* Linn. either in Bickley Copse, although they were extremely abundant in Alice Holt. In more recent years they migrated to the Aldershot district and became common. Curiously enough *Pararge aegeria* Linn. which used to be very abundant in the Copse entirely disappeared.

From 1874 to 1878 my father was stationed in the Home District and was employed at the War Office and Woolwich Arsenal. We resided at the Southern end of the Queen's Road, Peckham, opposite to a turning which led to St. Mary's Church, from which two bridle paths led, on the right to Nunhead Cemetery, and on the left to Catford through wood and farm lands. This was a favourite

collecting ground and the only house I remember was a public house named the "Brockley Jack" which was a favoured Sunday morning meeting place for the menfolk near by Brockley, to indulge in a gossip and an aperitif. In those days there were few licensing restrictions and one could obtain a drink at any time outside a three mile limit. On the fences and tree trunks on the way to Catford numerous moths could be found but it was too closed in for butterflies. Just before reaching Catford, was the river Ravensbourne, then a pure stream in which I used to catch coarse fish and an occasional trout. At the far end of Peckham Rye near Honor Oak the woodlands produced *Argynnis paphia* Linn., *A. cydippe* Linn. and *A. aglaja* Linn., but I had to be content with watching them as they were too alert to be caught in my small net.

A short way past our house (which was the main road with horse-trams operating) was a turning called Linden Road (so far as I remember) and here resided the well-known entomologist Edward Newman, the editor and founder of the "Entomologist". His son, who was rather younger than myself, attended the same day school, and being both butterfly catchers, we became friendly. I gathered however that he was brought up under very strict conditions and not allowed to follow too far his own inclinations. I well remember suggesting to him that he might take me home to see his father's collection, but he said that his father would not welcome boys, and if he took me home it would result in his getting a good hiding. Needless to say, being a very shy boy I very carefully crossed the road whenever I saw anyone looking like Mr. Newman. I have no doubt now that if my father had written to Mr. Newman on my behalf I should have received an invitation, but I never thought to ask him to do so. In those days boys were told to be "seen and not heard" and sent to bed soon after 7 o'clock.

Near Camberwell Green, a mile or so away from our house, was a naturalist's shop, in the window of which were displayed a number of British butterflies ranging from Purple Emperors and Camberwell Beauties from a shilling each down to Cabbage Whites at one penny. Practically every species of British butterflies were included and named, many of course having been procured from the Continent. I used to run all the way to the shop and back to feast my eyes on the cases, but in those days there was no such thing as regular pocket money, and all I ever had were tips from friendly visitors, and occasionally a bribe for taking unpleasant medicine, and as I was a very obstinate and unpleasant boy it sometimes required as much as half a crown to be deposited under my pillow. Such as I got was always spent on the "Boys' Own Magazine" which used to contain exciting stories of Greek and Roman characters. In 1878 my father was ordered to Colombo for a five year period, and much to my delight, he decided to take me, leaving the rest of my brothers to rent a house and live together with a housekeeper, to which I returned after four very happy years in Ceylon, mostly occupied in butterflying, hunting and fishing.

As I have implied before, small boys in the days I am writing about, were mostly the concern of their parents whom they were brought up to view with great respect. My own parents were kind and indulgent, and made many sacrifices for the benefit of their children. The only punishments I received were from the hands of other people. Both lived to become octogenarians, and for many years up to the days of their demise, we brothers made a point of gathering together once a week at their home, where we were received with great pleasure and much hospitality.

On my return from Ceylon it was not long before I commenced collecting, and when my father rented a house in Dornton Road, Balham, it happened that my next door neighbour was the late F. W. Frohawk, the famous butterfly and bird artist. All of us must know his book, the "Complete Natural History of Butterflies", and its wonderful plates and details of life histories, and I do not think it will ever be rivalled. We very soon became acquainted and made numerous collecting expeditions together. He was, I think, some five years my senior, and from him I learnt how to set, catch, and breed butterflies and hawk-moths which he then specialised in. I still possess a considerable number of his original paintings which he executed for me, and which I much treasure.

S. G. Castle Russell (119).

PRACTICAL HINTS — MAY

This series of monthly notes is intended to assist the beginner in his pursuit of Lepidoptera. Readers are invited to submit notes suitable for inclusion in these articles. These should be sent direct to me, at "Rio", Berkeley Avenue, Chesham, Bucks., two months ahead of the month for which they are applicable.

A busy time awaits the collector this month. Searching and beating for larvae, collecting by means of light, sugar and all other usual means. Trunk and fence searching, particularly when carried out fairly early in the day, is probably more productive during May and early June than in any other month.

Larvae of *Eupithecia sobrinata* Hb. (Juniper Pug) should be sought for in areas where the foodplant—Juniper—occurs. When present they can usually be obtained in fair numbers by beating. Aspen and Poplars should be searched rather than beaten, because many of the species which feed thereon are not easily dislodged. *Zenobia subtusa* Schiff. (the Olive) is usually in a single leaf folded over on its side, and fastened with silk. *Orthosia populi* Strom. (Lead-coloured Drab) spins two leaves together. *Clostera pigra* Hufn. also folds a leaf, wherein it lives and feeds until nearly full grown: at this time it ventures forth to feed openly after dark, but retreats to its folded leaf by day. This species prefers Creeping Willow but is frequently found on small Aspen saplings.

Beat Broom for larva of *Pseudoterpna pruinata* Hufn. (Grass Emerald), and *Chesias legatella* Schiff. (the Streak). Larvae of this latter species are normally green, but will be found to be bright yellow when they have been feeding on the flowers.

Those who desire to add *Geometra papilionaria* Linn. (Large Emerald) to their cabinets, should begin their search for larvae early this month. During the day it rests at the tip of a birch twig, usually on the south side of the tree, and some five feet high, but when fully grown is to be found higher up. Whilst searching Birch for *G. papilionaria*, keep a sharp look out for the many other Geometrid larvae which inhabit this foodplant; most of them will release their hold on the twig and swing at the end of a silken thread, when the bush is disturbed. Any larva which is found sitting on leaf or twig should NOT be forced off, as injury may result. Snip off the twig complete with larva.

Birch leaves rolled over from tip to stem lengthwise, should be examined for larvae of *Achlya flavicornis* Linn. (Yellow Horned). When young they are blackish in colour, and may use quite a small leaf, or only part of a larger one. Many collectors have trouble with larvae such as *Erannis defoliaria* Cl. (Mottled Umber), and *Erannis aurantiaria* Esp. (Scarce Umber) when about to pupate. The trouble is generally due to the type of material supplied to them for pupation. A moist, firm soil is essential; and a good sifted garden loam pressed down firmly, but not like concrete, will enable these larvae to pupate naturally. If supplied with light dry material like peat, the larva nearly always dries up before turning to a pupa.

Beat boughs of Maple in flower for larvae of *Eupithecia inturbata* Hb. (Maple Pug). *Bupalus piniarius* Linn. (Bordered White) rests in the branches of Pine and other Firs rather than on the trunk. Throwing stones into the branches will frequently dislodge the moths, which, when in flight, are difficult to net.

Should the night you choose for a collecting trip fail to bring results with sugar or light, do not 'give up the ghost' and return home with empty boxes. Take your lamp and walk round the hedges, woodland glades, or sheltered meadows; many moths will be found sitting on herbage, twigs or flower heads. This is often the case when night temperatures are low, and a cool wind blowing. Another reason for sugar not being a success is the presence of natural attractions, flowers, honey dew on leaves, etc. Searching with the aid of your lamp may reveal these sources.

R. V. Aldridge (262).

[*Erratum.*

In Mr. J. E. Knight's (94) article "A Setting Desk" (*Bulletin* **13**: 23) a reference is made to "¼" round beading". This should of course read "quarter-round beading".—Ed.]

SILK MOTH REARING

I am hoping that still more members may this year be tempted to take up silk moth rearing. In the years following the war there were only a very few species which could be ob-

tained commercially. AES members overseas rallied round and provided ova of a lot of moths which, so far as can be ascertained, had not been reared in Great Britain before. But the rearing of these was chancy and tricky and scarcely suited to beginners, except such inspired persons as Mr. Harrison-Gray (1806) (*Bulletin* **11**, 93-4) and Mr. W. R. Smith (1641) (*Bulletin* **12**: 9-11, 68-70).

A glance through our advertisement pages these last few months will have shown that there is now a wider choice of species to be had, among which the South Americans are especially new and satisfactorily hardy. Mr. Hugh Newman (503) continues to carry stocks of the tried and trusty species and has put us in his debt by printing a well-illustrated four-page leaflet, descriptive of several species most attractive to the beginner and embodying a good deal of rearing know-how, derived not only from his father's and his own long experience, but also from the knowledge gained by trial and error by AES members in the Silk Moth Study Group. This leaflet costs one shilling to AES members who care to write for it.

Perhaps I may close this note with a word of congratulation to Mr. C. F. Rivers (1443), who has been appointed to the Virus Research Unit and has, of course, ceased dealing with insects commercially.

W. J. B. Crotch (1181).

EARLY EMERGENCE OF *SATURNIA PAVONIA* LINN.

I have, or had, in my possession 10 Emperor (*Saturnia pavonia*) cocoons. These are being kept on shallow trays with various other types of pupae, in an unheated room. On the 10th of February, when giving them my customary check at 8.30 a.m., there was no sign of activity. On returning from work at 5.35 p.m. I again took a look at them, and again the result was negative. At about 7.30, however, I heard a faint scraping, and when I looked a female Emperor was emerging from its cocoon. I then took the cocoon and placed it in a breeding cage, where one hour later I found it with its wings expanded.

On the last three nights, at about the same time, another female Emperor has emerged. As this is two months before its usual appearance, and stranger still after the severe weather we have had, I would be very pleased if any member can tell me the reason for this, as I had intended breeding from them, but this is now impossible.

Brian Lomas (1984*).

OBSERVATIONS OF BUTTERFLIES IN ESSEX

The following are a few records of butterflies observed in the Maldon, Essex, area:—

In 1951 I did not observe one Clouded Yellow (*Colias croceus* Fourcr.), but in 1952 they were as common as Whites, flitting above over the lucerne fields with Painted Ladies (*Vanessa cardui* Linn.), which were even commoner; but 1953 has passed without my observing one specimen.

During the Summer of 1953 I noticed a White Admiral (*Limenitis camilla* Linn.) var. *nigrina*, which was feeding, and every time it took flight the Meadow Browns (*Maniola jurtina* Linn.) and Ringlets (*Aphantopus hyperantus* Linn.) would chase after it; a thing they never did to the ordinary White Admirals. The *nigrina* was apparently annoyed with this treatment, and was continually chased away, but my net put an end to it!

White Admirals were scarce in 1951, common in 1952, and extremely abundant in 1953, feeding with *Argynnis paphia* Linn., which was also very common.

Throughout 1953 most of the Nymphalidae have been more abundant than the past few years, and I have observed nine specimens of the Large Tortoiseshell (*Nymphalis polychloros* Linn.), eight in the Spring after hibernation, and one for my collection in August. The Summer brood of the Comma (*Polygonia c-album* Linn.) was greater than that in the Autumn.

I would like to know if the Clouded Yellow was common in Southern England this past Summer, as I am rather interested in the distribution of this butterfly.

T. J. Rutty (2114*).

[Mr. Rutty proposes to make a cycling tour of the South of England this coming Summer, to collect Lepidoptera, and wishes to get in touch with others who might like to join him in his venture.—Ed.]

A COLOUR VARIETY OF THE RED ADMIRAL (*VANESSA ATALANTA* LINN.)

In August 1949, I was walking along a lane at the back of some houses near my home at Bishopston, Bristol. I was watching the blossom clusters of Buddleia trees when I spotted what looked like a white Admiral (*Limenitis camilla* Linn.). It was in an awkward position, but I managed to capture it. On closer inspection it proved to be an extraordinary variety of the Red Admiral (*Vanessa atalanta* Linn.). All the parts which would have been red on a normal specimen were a dirty white.

Unluckily, as I captured it, I damaged it slightly. I looked up a great number of books, and could only find mention of a similar specimen in Frohawk's "Natural History of British Butterflies". If anyone could give me information about this or other similar varieties, I should be very grateful.

D. J. Stradling (3146).

SOME OBSERVATIONS OF SPHINGID LARVAE

Acherontia atropos Linn. (Death's-Head).

P. Rosamond (2246) writes:—

For anyone who is interested in the distribution of this moth, I found four in the pupal stage in a potato field near Huntingdon in October 1953.

Laothoë populi Linn. (Poplar Hawk).

From W. Bilbie (1679):—

I collected forty Poplar Hawk-moth eggs from the Poplar trees in my garden on 8/6/53; all eggs hatched out between 11/6/53 and 20/6/53. Out of forty, I lost one larva: this, I believe, was too idle to eat, as it always seemed to be asleep even while the others were feeding. Amongst this lot of larvae were individuals of several shades of green, light green, and dark green, some with one row of red spots, others with two rows, and some had spots all over their bodies. What amused me, however, were four larvae that were white, with two rows of red spots down their sides, and they kept this colour until they pupated. There was no difference in the pupae. Is this an unusual thing, or has anyone else had a similar experience with white larvae?

Deilephila elpenor Linn. (Elephant Hawk).

J. P. S. Pringle (2094*) reports:—

On September 2nd, 1953, while hunting Elephant Hawk (*D. elpenor*) caterpillars for Mr. Johnson's (1040) investigations I found one on a clump of willowherb from which I had previously, on the 26th August, taken five. This one was of the dark form and quite small, though in its final instar; I think it had recently moulted. It was resting on a stem, head upwards, so I cut the stem close behind its anal claspers; I should add that while this was being done it displayed vigorously, that is, assumed the "terrifying attitude" and threshed its fore parts from side to side. I cut off the top of the plant, thus leaving the caterpillar (displaying all the while) on a short length of stem, and then for convenience's sake held the caterpillar lightly by the middle between fore-finger and thumb preparatory to putting it in a box. At this rude treatment its anger bubbled over; it whipped its head round to touch my thumb and from its mouthparts exuded a drop of greenish liquid on to my skin. I was much surprised by this, and tried to get a repeat performance without success, so put it in a box and took it home, where it duly pupated. The greenish liquid, by the way, was not harmful to the skin, though, of course, I soon wiped it off.

Altogether I collected eight Elephant Hawk caterpillars in 1953, and this was the only occasion on which I observed this singular behaviour. Indeed, though I have reared quite a number of different species of caterpillars, I have never observed it before, nor have I seen any reference to it; admittedly, I am not in the habit of grabbing newly-moulted caterpillars by the middle. It could be said, I suppose, that I was squeezing it, but I was holding it very gently so I do not think that this is the explanation. Possibly it is a defence against predatory insects; if so, I should imagine it is rather effective.

One further point, Mr. Johnson in his article (*Bull.* **12**, 52-54) writes:—"Mr. Levett also noticed that older larvae failed to assume the 'terrifying position'," and goes on to speculate whether the larvae had learnt they were in no danger while in cap-

tivity. My own observations bear this out; all eight caterpillars displayed on capture, and would quite readily display for a day or so afterwards, but after that it was very difficult to get them to display at all.

A WASP NEST IN JANUARY

A note in *Bee Craft* **36**, 39 (1954) describes the finding of "a wasp nest the size of a football, complete with queen, workers and brood in all stages of development from eggs to young wasps ready to emerge from their cells" on 17th January 1954.

The nest was found in the vicinity of the apiary of the Enfield (Middx.) Beekeepers' Association. The exceptionally mild winter coupled with easy access to food from the beehives evidently encouraged the queen to continue laying.

B. R. Stallwood (1547).

LETTERS TO THE EDITOR

Dear Sir,

Having noticed the high cost of envelopes for posting the *Bulletins* to each member, may I make a suggestion to help cut down this expense? That each member saves his envelopes until December and then returns them for future use.

Yours sincerely,

H. L. Dolton (1122).

[The Council thanks Mr. Dolton for his very useful suggestion, and hopes that members will put it into practice during the year. By so doing, they will, as he points out, be saving the AES a considerable sum of money.—Ed.]

Mr. C. H. Ison (1343) writes:—

MYMARIDAE ("Fairy Flies")

Will any AES member interested in or having had acquaintance with these microscopic Hymenopterous Egg Parasites, please communicate with the Microscopy Group Secretary.

BOOK REVIEW

Insectes Sociaux, Bulletin de l'Union Internationale pour l'Etude des Insectes Sociaux, Vol. I, No. 1, Janvier 1954, 99pp. Masson et Cie, Paris.

Our entomological literature has been enriched recently by the publication of studies in social insect behaviour by Butler, Ribbands, Richards, Tinbergen, and von Frisch. In particular, Karl von Frisch's researches on the honey bee, begun before the 1914-18 war, have become already classical studies of great systematic beauty and literary elegance. The language of the bees, which von Frisch has deciphered, is yet another of the almost incredible miracles of nature which students present, from time to time, to an unbelieving world. The research of von Frisch is pure science, but already, as Tinbergen has pointed out, important practical conclusions have been drawn, with the result that the yield of seed clover has been increased by 40%. Less dramatic, but potentially important new lines of research are being conducted in the realm of pure entomological science, as for instance, myrmecological studies by the Brians in this country, Goesswald, and Schneirla. Much of the meaning of social organisation amongst ants, bees, wasps, and termites, is still wrapped in speculative mystery, and in some ways, our knowledge has not progressed very much beyond that acquired by scientists such as Lubbock, Forel, Wheeler, or Bugnion.

The potential fruitfulness of re-research lies behind the decision of the International Congress of Entomology in 1951 to set up the International Union for the Study of Social Insects. and we discuss here the first issue of this body's Journal. The more immediate reasons for the creation of a periodical, as the editors point out, are that there is an increasing body of biologists engaged upon research on the social insects, with the result that a distinct specialisation emerges; and also there is felt to be a need to create a bond between these specialists. The concentration of a new, specialised form of approach in entomology means that the big entomological congresses can no longer deal adequately with the many diverse disciplines which the word "entomology" now embraces.

Consequently, the Journal appears with articles in three languages (French, German, and English) with an international editorial board: Christensen (Denmark), Goesswald (Germany), Grassé (France), Jucci (Italy), Raignier (Belgium), Schneirla (U.S.A.), and Uchida (Japan). There are eight original articles in this first issue, which is due to appear quarterly: on the influence of the queen on worker fertility in ant colonies, by K. Bier (German), remarks on the internal phylogeny and sub-family classification of the family *Formici-*

dae, by W. L. Brown jun. (English), note on the exchange of ingluvial food in the genus *Myrmecia*, by C. P. Haskins and R. M. Whelden (English), the measurement of heat within nests of *Apis mellifica* during hibernation, by P. Lavie (French), a casual analysis of the aggressive behaviour of worker bees of *Apis mellifica*, by J. Lecomte (French), the "fertility substance" in the development of the ovaries in worker bees, by J. Pain (French), intraspecific problems in the taxonomy of insect caste, by A. L. Pickens (English), a new interpretation of the frequency curves associated with ant polymorphism, by E. O. Wilson (English). In addition, there is the editorial in three languages, news of the Union and a list of members, in French, and, for light relief, a letter by one member accusing another of unethical behaviour in the matter of acknowledging his sources.

It will be seen that the material of this Bulletin is highly technical, and it is, of course, a medium of expression for skilled experts who are versed in the esoteric language of their trade and who also read three languages fairly fluently. Assuming the latter competence, however, much of the information is of interest in that it indicates the lines of research which various workers are following and, indeed, the first article mentioned above (by K. Bier) is written simply and is illustrated with line drawings, as well as tables.

The journal is well produced with clear printing on good quality paper, although it must be said that the proof-reading is not altogether what it should be. It is to be hoped that one influence of this new publication will be to provide entomologists in this country with stimulating material on termites which do not receive as much attention as ants and bees, except perhaps to consider the manner of their extermination. This may be due largely to the fact that termites are not found in this country; it is interesting to note that there is a termite research centre at the Bayer factory at Leverkusen, Germany, where termites also are not found. The secretary of the British section is Dr. M. V. Brian, Furzebrook Research Station, Wareham, Dorset, and the annual subscription for the Bulletin is 460 Belgian francs (approximately £3 6s 0d), or for members of the Union 286 francs (£2), and the general secretary of the Union is M. G. Richard, 105 Boulevard Raspail, Paris VIe, France. A. N. B.

IN LIGHTER VEIN

A New British Species?

(*Fritteria argentivora*?)

Members can hardly be unaware of the sudden prominence this winter of a strange insect on hoardings and buses, in Post Offices and the sheets of newspapers. The following notes on *Fritteria argentivora* may be of interest:—

Locality and habits—Widespread. Specimens were easy to find everywhere—in fact, it was difficult to *avoid* them, especially in streets. In daytime they were to be seen hovering about banks where the piled slime* flows, but they were more active in the evening at places of entertainment and refreshment. Never found in museums or public libraries.

Food—*F. argentivora* had a habit of chipping coins with its pick-like proboscis! (This organ was no doubt hollow for sucking up liquid assets.) Larvae certainly fed on valuable paper.

The biochemistry of digestion in this species is obscure. How, for example, does the design on the larval food become reproduced in the wings of the imago?

Identification points—Remarkable bi-lateral asymmetry of wing reticulations — abdomen bears a mark somewhat like £ (compare wing marks of *Polygonia c-album*).

Classification — Strangely difficult on the meagre evidence available. Obviously, having four wings, it cannot belong to the true flies (Diptera), to which order Lewis Carroll's rocking-horse-fly, snap-dragon-fly, and bread-and-butter-fly may belong. Probably some relative of the humbug.

Remarks—The cold weather in the first week of February seems to have killed off most of the insects, for few could be observed afterwards. Although there is no reason to suppose that the species is extinct, our knowledge of it is unlikely to increase much. Keeping and breeding *F. argentivora* are clearly against the national interest. Anyone finding a live specimen should send it at once to the Ministry of Agriculture or National Savings Committee. It will then soon be drowned in departmental channels.

E. R. Wood (2277).

*Filthy lucre.

Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. 1954.

AES

Members can help the Society in several ways:—

(a) By dealing with advertisers and mentioning the *Bulletin*.

(b) By bringing in new members. (Subscription, 12/- per annum. Juniors, 6/- per annum.)

(c) By buying AES publications and suggesting Public Libraries should buy them.

(d) By friendly co-operation with other members.

(e) By taking just that extra bit of trouble required to record happenings of note for the *Bulletin*.

AES NOTICE

WHERE TO WRITE

Membership applications, offers of help to: D. OLLEVANT, *3 Salcombe Drive, Morden, Surrey.*

Advertisers to: L. W. SIGGS, *10 Repton Road, Orpington, Kent.*

Changes of address and non-arrival of Bulletins *to:* B. L. J. BYERLEY, *48 Elmgrove Road, Harrow, Middlesex.*

Offers to lead Field Meetings, exhibit, etc., to: K. H. BOBE, *19 Hengist Road, London, S.E.12.*

Manuscripts, drawings and books for review to: B. R. STALLWOOD, *19 Southfield Gardens, Strawberry Hill, Twickenham, Middx.*

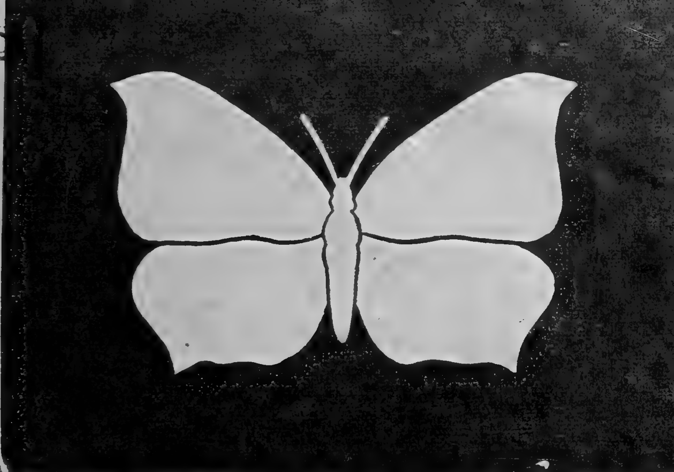
Subscriptions (12/- per annum, 6/- for Juniors) to: R. W. WATSON, *15 Halstead Road, Bitterne, Southampton.*

Youth matters to: S. M. HANSON, *167 Gunnersbury Park, London, W.5.*

VOL. 13

No. 162

E - - 1954



THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

EDITED by B. R. STALLWOOD

AES NOTICE

WHERE TO WRITE

Membership applications, offers of help to: D. OLLEVANT, *3 Salcombe Drive, Morden, Surrey.*

Advertisers to: L. W. SIGGS, *10 Repton Road, Orpington, Kent.*

Changes of address and non-arrival of Bulletins to: [illegible] *grove Road, Harrow, Middlesex.*

Offers to lead Field Meetings, exhibit [illegible] *London, S.E.12.*

Manuscripts, drawings and books for review to: B. R. STALLWOOD, [illegible] *Twickenham, Middx.*

Subscriptions (12/- per annum, 6/- for Juniors) to: R. W. WATSON, *15 Hal-* [illegible]

Youth matters to: S. M. HANSON, *15 Gunnersbury Park, London, W.5.*

AES BULLETIN

No. 162

JUNE 1954

FURTHER OBSERVATIONS OF THE LARVAE OF *ARCTIA CAJA* LINN. (Garden Tiger)

Mr. R. H. Benson has raised some interesting points in his notes on the Garden Tiger Moth (*Arctia caja*) (*Bull.* **12**: 61 and 91). I have been breeding this species for a number of years, and have larvae hibernating (I hope) in my cages now. Until recently, I had never met with larvae before hibernation, apart from one or two in my garden, which were almost certainly refugees—or at least, escapees—from my breeding cages. But last October, while beating blackthorn and hawthorn for larvae of the Lappet Moth (*Gastropacha quercifolia* Linn.) a larva of *A. caja* fell into my tray. I could hardly believe my eyes. I had overlooked Mr. Benson's note, and was unaware that ova of this species had been found on trees. I looked again at the blackthorn bush that I had just beaten, and then noticed one or two nettles growing against it. I at once concluded that the larvae had come from one of these, and, forsaking temporarily the blackthorn, I started to belabour the very few nettles which grew by the hedge. From these I beat two more *caja* and then, after a careful search, I found a fourth resting on a withered blade under the hedge. Knowing that ova of this species are laid in batches, I expected to find many more, but although I diligently searched the surrounding herbage and beat the hedge, I found no others.

I left the nettles and returned to the blackthorn, and to my quest for *G. quercifolia*. I had moved some considerable distance away, and after beating a hawthorn bush, found two more *caja* in my tray. There was no doubt, this time, where they had come from. A week later, I beat two more from hawthorn about a quarter of a mile away, and the same day, found three resting on leaves high up on the gooseberry bushes in my garden.

Mr. Benson is curious as to the transfer of the larvae from the trees to the ground, and goes on to ask: "Do they then drop to the ground, where they remain during and after hibernation?" But do they hibernate on the ground? Has anyone ever come across hibernating larvae of this species?

It has always seemed unlikely to me that a hairy larva like *A. caja* would hibernate on the ground. In captivity, the majority of the young larvae congregate at the top of the cage, but of course, this does not prove anything. The question I asked myself when I beat larvae from the hedgerow last October was: Why did they go up? The only solution which occurred to me was that they had climbed the hedge in order to spend the winter there—a much more suitable place, I should imagine, than the ground. I remembered that I had not infrequently found larvae after hibernation feeding on my gooseberry bushes, and I remembered having read somewhere that in the early spring, larvae of an allied species (*Arctia villica* Linn.) were often to be found sunning themselves and feeding on the tender shoots of gorse. Is it not probable that they spend the winter on those same gorse bushes?

Mr. Benson states that the four larvae he collected took up winter quarters on a rolled and blackened leaf, and suggested that when the leaves fall, this affords the larvae a method of reaching their ultimate foodplants on the ground. It is, of course, possible that the larvae pass the winter in rolled leaves which have fallen to the ground, but I do not think they would choose this method of reaching their foodplants on the ground. I imagine they would either descend the bush or tree under their own steam or, more probably, just fall off. Clothed as they are with long hairs, they could fall from great heights without injury.

I do not think the larvae of *A. caja* are gregarious in the true sense of the word, except, possibly, in the first instar. Once they have moulted, they separate and go their several ways—at least, they do in my cages. If a batch of eggs is laid on an isolated patch of White Dead Nettle of adequate extent, it is pos-

sible that a large number of the larvae will be content to stay where they are, and not wander off in search of pastures new. In April, 1951, I found 30 half-grown larvae on a patch of White Dead Nettle covering about 3 yards square. They were well spread out, and it took me about an hour to collect them. I do not think this proves that they are gregarious, even though it is possible that there were as many, perhaps even twice as many, remaining which I did not find.

I am grateful to Mr. Benson for his notes, and if I have ventured to disagree with him on one or two points, it is in the hope that someone will take the trouble to correct me where I have gone astray, and perhaps even supply the answers to some of the problems.

G. S. E. CROSS (1453).

With reference to Mr. R. H. Benson's notes on *Arctia caja*:—For the past two years I have noticed the gregarious larvae on a willow, and found the survivors in numbers on the mass of nettles and " keck " which grew underneath, the next spring.

H. F. TEBBS (1897).

WINTERING PUPAE

I have read with much interest Mr. R. V. Aldridge's article "Another Idea for a Pupa Cage" in *Bulletin* **13**: 51, and I may be able to add something to his suggestions for storing pupae. But first of all let me disclaim his courteous and far too generous remark that I know "more about breeding than most of us": if I have ever insinuated that I know anything at all about Lepidoptera may God forgive me. So far as I can recollect I have written only about my own individual methods and have refrained from criticising other people's ideas. And probably I have had no more successes than other breeders. If I have, it is due solely to the fact that I used to treat my larvae as though they were racehorses in training—more, as though each one was a Derby favourite. If you do this you ought—as the great Dr. T. A. Chapman remarked fifty years ago—to rear well nigh every larva that hatches from a batch of eggs. Strictly hygienic surroundings, sterilised cages and water-bottles, the choicest of fresh food daily (twice daily in hot weather), careful spraying with tepid rainwater to take the place of dew—laboratory conditions in fact, coupled with constant attendance, should ensure percentages in the nineties every time.

And do they? Not on your life. I have had one hundred per cent. successes with species commonly reputed "difficult" and I have had "easy" species die off like house-flies in wintertime. I have brought every single individual of a large brood of Common Tigermoths safely through the winter—and next year every single individual of an equally large brood died on me. We can only do our best, using such intelligence as is our portion, and go on trying. The uniformly successful rearer of larvae, the man who has never known failure and attains 100 p.c. results every time, has not yet been born, and I do not think he ever will be.

Mr. Aldridge refers to some remarks on wintering pupae that I made in a book written before the last war though not printed until 1943. The war demolished a good many pet theories and my method of storing pupae was among them. Hitherto I had always kept my pupae throughout the winter in an outhouse. It was an ancient structure built entirely of wood and exposed to the weather on all sides. I removed my pupae from the pupating troughs in November, laid them face downwards on corrugated cardboard on the floor of an observation cage, and put the cage in the aforesaid outhouse. My pupae did well there: the damp atmosphere prevented them from drying up, and as the building was not draughty and its walls were thick, rapid changes of temperature out of doors were not reproduced immediately inside the shed. The moths emerged as one expected them to, and it was rare for me to breed a cripple.

Then the war drove me afield and I had perforce to winter my pupae in a cellar. The same practice was adopted, for the cellar was not dry and the air was still. Again I had no reason to complain of non-emergences. But a year or two later, and after my book was printed, the only place available for my improvised pupa-cage was a draughty unoccupied flat over a range of stabling, and here I had indeed cause to complain. An appreciable percentage of my pupae failed to result in moths, and upon breaking open the dead ones it was plain that they had simply

dried up. I had failed to prevent, throughout winter, loss of water by evaporation.

It was at this time that I began to correspond with the late Frank Littlewood of Kendal, who was, without question, the finest and most knowledgable rearer of macrolepidoptera in the kingdom. It was a correspondence which was a constant joy to me and it continued almost weekly until his death. In 1941 he had published in the *Entomologist* a series of articles on rearing Lepidoptera and in the issue for November (vol. **74**, pp. 257-259) he described his method of dealing with pupae. It was the failure of my method which induced me to write to him, and between us we evolved a pupa-cage (the Littlewood Pupa-Cage) that is probably the best cage for its purpose which has yet been invented. The basic principle, which was Littlewood's own, was as described by him in the *Entomologist* and incidentally it is the same as that recommended by Mr. Aldridge; but between us we modified and improved its efficacy very considerably.

Until this cage was evolved Littlewood used to adopt the procedure with his wintering pupae which Mr. Aldridge tells us "most collectors . . . probably adopt", namely that of keeping them in closed tins in a cool place, such as a cellar. But the very first time I tried this plan my pupae met with disaster. This disaster 'shook' Littlewood, and it was then that he suggested we should concentrate on evolving "the perfect pupa-cage". The disaster was briefly this. Having dipped the tins in boiling water to sterilise them, and each being duly labelled with the name of the species it was to contain, I covered the bottoms of the tins with pupae and placed the tins inside a large square biscuit tin, which was then deposited in a cellar. Having done this I thought no more about my pupae until the end of February. When I opened the tins on the 27th of that month to see how my pupae were getting on I found that most of them were swarming with mites (*acari*), which had been feasting upon broods of Marbled Brown, Lunar Marbled Brown, and Blossom Underwing. But worse was in store. Upon opening a tin containing some twenty Yellow-horned I found that six moths had already emerged, though not expected to do so until the second week of March at the earliest. They were all very much alive and their appearance, to use an overworked cliché, "beggared description". Their bodies, their undeveloped wings, the unemerged pupae and the tin were smothered in a welter of meconium and shed scales. I washed each of the unemerged pupae with a camel-hair brush; but in spite of this only one perfect moth emerged out of the twenty pupae which had been put into that tin. As for the tins with mites, pupa after pupa was found to contain only a reddish-brown dust.

Even that was not the sum total of my disaster. On opening a tin containing cocoons of the Northern Eggar I found that during the short time which had elapsed between pupation and removal of the cocoons to the tin one of the accursed clothes-moths which exist solely for the purpose of tormenting lepidopterists, had laid its eggs on one of the cocoons; for some five or six grubs had occupied themselves during the winter by eating as many cocoons, and when they had had enough of the cocoons they had started in upon the pupae.

This lamentable result of my first experiment in wintering pupae in tins not unnaturally set me dead against this method. In theory it is sound, and perhaps one might follow it for years without a mishap. But there must always be the risk of unseasonable eclosion. I do not think it would be an exaggeration to say that almost every species of our macrolepidoptera has been known to emerge out of season. I have had an Iron Prominent emerge in an outdoor cage on 4th November and Pale Tussocks quite often in January. Whenever such a thing happens inside a closed tin my experience with a Yellow-horned will be repeated. Even if one uses a tin two or three inches deep, with rough sides (*e.g.* cardboard) so that moths which emerge unseasonably can climb up and expand their wings, there is the danger of other pupae in the tin being plastered with meconium. And what will be the state of the emerged moth if by chance it is left for even a single night before being discovered?

The improved Littlewood Pupa-Cage does away with all difficulties connected with the winter storage of pupae. A glass lid enables one to in-

spect all its contents at all times and the cage can be kept throughout the winter, if desired, in a sittingroom which has a fire in it day and night. It is impossible for the pupae in it to dry up because the relative humidity (*i.e.* the percentage of water-vapour in the air as compared with the maximum (saturation) at a particular temperature) of the air in the cage is always sufficiently high to prevent loss of water by the insects in it. With your permission, Mr. Editor, I will describe it in a subsequent issue of the *Bulletin*. P. B. M. ALLAN.

PRACTICAL HINTS — JUNE

Seed capsules of the Campions should be collected and stored in a large tin. Add fresh capsules occasionally. From these you will probably get larvae of the Campion (*Hadena cucubali* Schiff.), Lychnis (*Hadena bicruris* Hufn.), Marbled Coronet (*Hadena conspersa* Schiff.), Tawny Shears (*Hadena lepida* Esp.), etc. Some breeders prefer to cover the bottom of the tin with a two inch layer of damp compost, into which the larvae will burrow and pupate; others remove full fed larvae to a separate tin of compost.

The Drab Looper (*Minoa murinata* Scop.) though very local, where Wood Spurge grows, is plentiful in its chosen area. The moth flies by day, and most specimens taken on the wing are not in the best condition. Take therefore two females; these will supply all the ova required. The larvae should be transferred to a spray of foodplant (Wood Spurge), kept in water, immediately they hatch. For pupation, supply dry peat fibre, among which they will spin a fragile cocoon. This species is very easy to rear.

The Grass Waved (*Perconia strigillaria* Hueb.) is another day-flier, and may be found on dry heathland where Broom is plentiful. The males take to the wing when disturbed and frequently soar out of reach, whilst the females only fly a short distance and are more difficult to flush. By keeping a sharp look out, they can usually be found sitting on grass or leaves close to the ground. The larvae of this species hibernate when fairly small and are not easy, unless you can sleeve them out on a growing plant of Broom or Gorse.

The Four Spotted (*Acontia luctuosa* Schiff.) is to be found flying low and very swiftly over clover fields during the day. Also comes to light after dark.

Beat Elms for larvae of Lesser Spotted Pinion (*Cosmia affinis* Linn.) and White Spotted Pinion (*Cosmia diffinis* Linn.).

Mr. A. Kennedy (20), of Leeds, mentions a method of keeping larvae in quantity on growing foodplant. For species which feed on low growing plants in the garden, he makes up a box framework and places this over the plants. The top is covered with glass or muslin. When the larvae are full fed they are removed to a closed cage for pupation.

After a heavy thunderstorm many larvae which have been blown or washed off their treetop abode, may be found crawling about on the ground beneath the tree. A row of oaks overhanging the roadway near my home, always yield a good assortment, if visited immediately a storm has abated.

Towards the end of June, visit localities where Wych Elm grows plentifully, and search for Blomer's Rivulet (*Discoloxia blomeri* Curtis). This pretty little moth has a habit of sitting on the leaves of Dog's Mercury, a plant which always seems to grow under these trees.

Another species found under these conditions, but during the first half of June, is the Clouded Magpie (*Abraxas sylvata* Scop.). Though very local, it is abundant in its restricted areas.

Honeydew on foliage, and grass flowers are great attractions for moths, and are frequently the cause of our failure with sugar. Remember this when sugar draws a blank, and look to the grass flowers!

Beat and search Birch for the Pale Oak Eggar (*Trichiura crataegi* Linn.) larvae. They prefer the sunny side of the tree, and usually rest on the branch or twig, rather than on the leaves.

Whilst searching the Birch trees for larvae, keep a sharp look out on the trunks for imagines of the Coxcomb Prominent (*Lophopteryx capucina* Linn.) which is frequently found drying its wings low down on the trunk.

The Cistus Forester (*Procris geryon* Hb.) will be flying on the chalk slopes this month; warm sunny hollows often swarm with them.

R. V. ALDRIDGE (262).

A SETTING DESK

With reference to *Bulletin* **13**: 23, it is worth noting, before it is too late, that should you be so obtuse as to have been built left-handed, you will have to build a mirror-image of

Mr. Knight's setting-desk, or you will find it of little help to you.

PETER G. TAYLOR (719).

A USE FOR NYLONS

From BRIAN LOMAS (1984*)

On looking through my copy of "Practical Methods and Hints", I came across a sketch which interested me very much. This was Fig. 37 in the article on breeding cages. For those members who have not yet obtained a copy of this excellent publication I will describe it very briefly. It is a sketch of a potted plant, sleeved with the aid of a spiral of stiff wire, to keep the weight of the sleeve off the plant.

I have myself used this method to rear larvae, but instead of using muslin or brussels net for the sleeve, I use nylon and silk. This material was made for the purpose of advertising ladies' stockings, and is in 18″ and 24″ lengths, each length being neatly whipped at the ends to prevent fraying. This material is strong, transparent, and obtainable in a wide variety of meshes, and I think it is perfect for this purpose. I have found it very useful and I would be pleased to hear if many other members use cast-off nylons.

"OTHER" INSECTS AT LIGHT

1. In Malta

In reply to Mr. H. K. Airy Shaw's note in *Bulletin* **12**, 95, concerning the taking of insects other than Lepidoptera at light.

In the last ten months I have taken, in Malta, the following at light:—

Coleoptera—*Blaps gages* Linn. These crawl along the ground and bask in the light from the lamps (four).

Hemiptera—*Reduvius pallipes* Klug (numerous), *Reduvius personatus* Linn. (six), *Brachypelta aterrima* Först. (one), *Rhinocoris erythropus* Linn. (three), *Lygaeus pandurus* Scop. (numerous).

Hymenoptera—Ichneumonidae: *Anomalon sp.* (twenty-five), two large (not yet identified).

Neuroptera — *Creoleon plumbeus* (Oliv.), *Morter hyalinus* (Oliv.).

DAVID H. HEPPELL (1690).

2. In Hampshire

In response to H. K. Airy Shaw's request for records of insects other than Lepidoptera, at light (*Bull.* **12**, 95), I submit the following observations of Coleoptera, at Liss, Hants., over a period of four years ending June 1953. The locality was an Army workshop, lit by 30 100-watt lamps, which stood on a fairly extensive area of heath. The heath itself was mainly sand and bog, the vegetation being chiefly Scots Pine, Birch, Heath and Gorse.

Lamellicornia — *Geotrupes stercorarius* L., *Aphodius rufipes* Linn.

Hydradephaga—*Agabus bipustulatus* Linn.

Longicornia—*Prionus coriarius* Linn., *Criocephalus polonicus* Motschulsky.

Clavicornia — *Necrophorus vespillo* Linn.

Phytophaga—*Phyllobrotica 4-maculata* Linn.

Geotrupes stercorarius was taken quite commonly in the summer months. It usually appeared at dusk rather than when it was really dark.

Aphodius rufipes was the most abundant beetle, and, unlike *G. stercorarius*, flies well into the early hours of the morning. In the short time I have spent in Cumberland, and during frequent visits here, *A. rufipes* has been quite a common visitor, usually found on the window-sill. A point of interest is raised here. During bright periods, in daylight, I have taken most of the common *Aphodii* in flight, especially *fimetarius* and *punctato-sulcatus*. Never have I taken *rufipes* in the daylight, or any other species in the dark. Can it be that *rufipes* is a night-flyer—the only one of a large genus, and, if so, why? Up to the present this has been my experience and I should be very interested if someone could produce records to the contrary.

Agabus bipustulatus was represented solely by two males taken on 12-13 June, the time not being recorded. This is a very abundant species in the district, and I expected to see it frequently with *Dytiscus marginalis*, which never appeared at light.

Prionus coriarius I took on nine occasions. It is an impressive sight as it circles a lamp, resembling an autogyro in miniature. I might insert a few words regarding the larval food of this insect. It is generally assumed to show a preference for Oak, Beech, etc. On the two occasions I have taken the larvae, they have been on Scots Pine. The first time four were taken, and two a few

weeks later, about four miles away from the first locality.

Criocephalus polonicus. Three specimens were taken, two in July 1951 and the other August 1952. I never found this insect under other circumstances.

Necrophorus vespillo. A single specimen at 23.35 hours, May 11, 1952.

Phyllobrotica 4-maculata. June 18-19, 1952, I picked up a specimen crawling on the floor which had obviously flown in. Although I made a thorough search of the locality I never found this beetle again, or its food-plant, Greater Skull-Cap.

In late April and May every year *Melolontha vulgaris* swarmed in very large numbers at these lights, but I was never fortunate enough to see it myself. It usually appeared just after dusk and ceased to fly at midnight, according to several witnesses.

A less common visitor, in June and July, was *Amphimallus solstitialis*, with similar habits to *Melolontha*. I never managed to take this beetle myself, either.

Near this workshop, a three mile road ran to Liphook. On the grass verges *Lampyris noctiluca* was very common. The nearest I ever took the beetle, in relation to the workshop, would be roughly 100 yards. Although the male is a reputedly common visitor to light, I never saw it here and there was never one given to me which had been taken at light.

S. E. ALLEN (2001).

COUNCIL FOR THE PROMOTION OF FIELD STUDIES

Juniper Hall Field Centre, Dorking, Surrey

Beginners' Entomology Course. An introduction to the study of insects for boys and girls of 15 years of age or over, including instruction in collecting and museum techniques. July 28-August 4, 1954. Inclusive fee 5½ guineas per week. Further particulars from the Warden.

Field Course in Invertebrate Zoology (especially insects), July 7-21, 1954. This course is intended for undergraduates, specialist amateurs, museum officers and teachers with some zoological knowledge. Inclusive fee 5½ guineas per week; visitors may attend either or both weeks. Further particulars as above.

COENONYMPHA TULLIA MUELL.

CORRECTION (?) AND A PROBLEM.

With reference to my short note, "Collecting in Malta", published in *Bulletin* **13**, 12, I have had several letters from members, for which I must sincerely thank them, querying the occurrence of *C. tullia* in Malta. In reply to these letters I have stated my view that the four specimens, taken by me in June 1953, were indeed *C. tullia*, approaching near to our northern species, var. *laidion*.

After further study I feel that I must submit to the opinion of authorities greater than I. These state that *tullia* does NOT occur in Malta but a large variety of *Coenonympha pamphilus* Linn. exists which is very similar to *C. tullia laidion*. Indeed, Sandars states that, "Size alone, distinguishes this northern form from the Small Heath".

Personally I am still not satisfied that this is *pamphilus*. It has a wing-span of 37 mm. against *pamphilus'* 25 mm., a much brighter colour, and not the dark, greenish-brown underside of the latter, and there seem to be no intermediate forms. It would be interesting to rear them to see if they breed true, and if they will breed with normal *pamphilus*. Are they indeed *pamphilus*, *tullia* or a distinct species? I, however, have no time for breeding at the moment, so here is work for others.

I intend to collect further specimens this summer and distribute them to other AES members for their views. Microscopic examination of genitalia etc., may elucidate the problem. This I intend to undertake in the near future and will report thereon.

DAVID H. HEPPELL (1690).

OTHER FOLK'S ACTIVITIES

The General Editor has received from Vienna the third issue of an entomological bulletin (*Entomologisches Nachrichtenblatt*) produced by the local equivalent of our own Society (Arbeitsgemeinschaft österreichischer Entomologen). It is a duplicated leaflet of sixteen pages, very similar to our own original productions. The Viennese society however enjoys an activity which was never possible for us. It appears to meet weekly; once a month for open discussion, once for exchanging material, and twice to hear lectures.

Judging from the third bulletin, their emphasis, like ours, is on the practice of entomology and the sharing of knowledge about distribution, methods and "dodges". Coleoptera

loom a little larger than Lepidoptera, but that may be an editorial accident.

We wish the society well. Perhaps some member whose German is fluent would like to make contact by correspondence or when on holiday. The address is Eisenbahnerheim, Wien V, Margaretenstr. 166.

BOOK REVIEW

The Bee Walk: Being the Romance and Practice of Beekeeping. By Amy F. E. Lisney. 114 pp., 21 pls. Published by the author, and obtainable from E. W. Classey, F.R.E.S., 91 Bedfont Lane, Feltham, Middx. Price 10/6.

This is not a scientific work on bees, —that must be emphasized straight away—it is rather a collection of general information and personal experiences. I found it entertaining reading; for it is a book which one can read by the fireside to gain an introduction to beekeeping without going into too much detail.

The authoress has included some details of the anatomy, physiology and behaviour of the Hive-Bee. It is here that my chief criticism lies. This part of the book is full of inaccuracies and misconceptions. It is clear that the authoress is unfamiliar with the writings of von Frisch on the "dancing" bees; she states that she cannot accept his theory. One wonders how she explains von Frisch's finding of the hidden sugar sources indicated by the returning scouts. Mrs. Lisney suggests that the "dancing" is pure "joie de vivre". Her views on the subject of selective breeding and artificial insemination are obviously purely personal, for who can say that artificial insemination cannot improve on Nature?

To the beginner the descriptions of actual beekeeping practice will be very useful, although many beekeepers will disagree with the practice of the cutting out of queen cells to prevent swarming.

A very useful feature of the book is its index, which will enable those unfamiliar with beekeeping equipment, to find an explanation of the function and purpose thereof.

In summary, here is a non-scientific book about beekeeping, written in a style which is enjoyable to read and which, at the same time, contains much useful information. **T. B. P.**

VOLUCELLA ZONARIA PODA (DIPT. SYRPHIDAE).

I have no doubt many members, who are not necessarily dipterists, have met this outsize hover-fly in recent years.

Since 1945, it appears to have established itself at least in S.E. England, and I have been lucky enough to observe it in my garden in Middlesex almost every year since that date.

I have always found it on buddleia bloom, where it can be seen hanging upside down, busily feeding, and usually appearing in ones and twos on most days during the flowering period of the tree. Last year, however, on one occasion, as many as five were observed.

Outside my garden I have seen but one specimen, on an oak tree in a wood at Oxshott, Surrey.

B. R. STALLWOOD (1547).

ANNUAL GENERAL MEETING

The Annual General Meeting was held, by courtesy of the Linnaean Society, in their rooms at Burlington House, on the afternoon of Saturday, 27th March 1954. It was preceded by a conversazione, and by a very interesting talk by Mr. S. Beaufoy (627), "Entomology with a Camera", which he illustrated by his excellent slides.

As a result of uncontested elections, the AES Council for 1954-55 is constituted as follows:—

President: P. Le Masurier (978).
General Secretary: D. Ollevant (1514).
Treasurer: R. W. Watson (752).
General Editor: W. J. B. Crotch (1181).
Bulletin Editor: B. R. Stallwood (1547).
Publications Secretary: C. B. Pratt (784).
Advertising Secretary: L. W. Siggs (243).
Meetings Secretary: K. H. Bobe (912).
Youth Secretary: S. M. Hanson (320).
Registrar: B. L. J. Byerley (788).
Councillors: W. B. Broughton (1632), L. C. Bushby (1075), D. I. Chapman (1648*), B. A. Cooper (19), R. R. H. Hill (2253*), R. Hilliard (99), C. H. Ison (1343), E. Lewis (952).

The General Secretary presented the Council's Report for 1953.

COUNCIL'S REPORT FOR 1953

The number of subscriptions paid for 1953 was 856, and adding those members joining from the 1st September whose subscriptions cover 1954, the

final membership figure for the year was 924, made up of 693 Ordinary, 202 Junior, 22 Associate and 7 Honorary members, compared with 905 the previous year. New and rejoined members numbered 69 Ordinary, 70 Junior and 3 Associate members, a total of 142 and an increase of 11 compared with 1952.

During the year Mr. E. E. Syms accepted the Council's invitation to become an Honorary Member. Among deaths must be recorded with regret, that of an Honorary Member, Prof. G. D. Hale Carpenter.

The *Bulletin* appeared with its accustomed regularity. The volume totalled 96 pages, and this year did not, of course, include the membership list. Two new Leaflets were published: No. 25, " Collecting Bumble Bees" by Mr. T. B. Poole, and No. 26, "Collecting Collembola" by Mr. P. Barrett.

The Annual General Meeting, preceded by a film show of more than ordinary interest, was held on the 21st March, when we again enjoyed the hospitality of the Linnaean Society.

The Society's stall at the School Nature Study Union's Jubilee Exhibition on the 8th May aroused much interest, and particularly its live exhibits, and gained a number of new members.

The Annual Exhibition was held on the 19th September, and was as successful as in previous years in providing an enjoyable opportunity for the meeting of a large number of members and friends. A detailed report was published in the *Bulletin*.

On the 30th October the AES enjoyed the honour of being the Guest Society at the Annual Dinner of the South London Entomological and Natural History Society at the Holborn Restaurant. The Society was officially represented by the President, Treasurer and General Secretary, and other members were also present.

Though with notable exceptions, the Study Groups as a whole suffered from diminished support.

The Blues Group continued the exchange of information and specimens, but it was a cause of concern to the convener that he was unable to give more time to the Group. Also, it had not the large membership covering most of the country necessary for success in its activities.

A few more members became interested in the Cockroaches Group, but nothing of interest was accomplished, as a suitable breeding cage had not been devised, and it was not found possible to rear specimens of cockroaches from the egg.

Progress in the Elephant Hawk Group was unsatisfactory, and the response to the convener's questionnaire sent to members with the August *Bulletin* was disappointing.

Though few in numbers, the Larval Colours Group carried out a very interesting experiment of its own devising, using *Euplexia lucipara* Linn. (Small Angle Shades), which seemed to lend support to the "phase coloration theory." Further experiment on this species was planned for next season, and much effort was put into collecting information, with considerable success.

The Microscopy Group continued to thrive, and reached a membership of 19. The group's own " Circular Bulletin " was regularly received by all members. It proved a help, and means of contact, to widely-separated individuals with common interests.

Among its contents were a number of lessons on dissection and a series on making entomological micro-slides.

The Pupal Emergence Group was again hampered by lack of sufficient support, but it was possible to consolidate certain details.

The leading activities of the Silk Moth Group were at the School Nature Study Union and AES Exhibitions, where many ova and larvae of tropical silk moths were distributed. Experimental work was undertaken on the artificial enriching of larval food in winter, and a report was published in the September *Bulletin*.

The Weevils Group received no support during the year.

The London Meetings Group was formed during the year, and held the first two of a series of meetings in November and December. The Council hopes that the example set by this Group will be imitated in other parts of the country.

No information has been received concerning the Diapause and Insect Galls Groups, and the Orthoptera Group became defunct through the lapse of membership of the convener.

Six Council Meetings were held during the year, with an average attendance of eleven.

E. Lewis (952),
Hon. General Secretary.

Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. 1954

VOL. 13
No. 163
1954

THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

EDITED by B. R. STALLWOOD

AES NOTICE

WHERE TO WRITE

Membership applications, offers of help to: D. OLLEVANT, *3 Salcombe Drive, Morden, Surrey.*

Advertisers to: L. W. SIGGS, *10 Repton Road, Orpington, Kent.*

Changes of address and non-arrival of Bulletins *to:* B. L. J. BYERLEY, *48 Elmgrove Road, Harrow, Middlesex.*

Offers to lead Field Meetings, exhibit, etc., to: K. H. BOBE, *19 Hengist Road, London, S.E.12.*

Manuscripts, drawings and books for review to: B. R. STALLWOOD, *19 Southfield Gardens, Strawberry Hill, Twickenham, Middx.*

Subscriptions (12/- per annum, 6/- for Juniors) to: R. W. WATSON, *15 Halstead Road, Bitterne, Southampton.*

Youth matters to: S. M. HANSON, *167 Gunnersbury Park, London, W.5.*

BACK NUMBERS

OF THE

AES BULLETIN

1s. 3d. a copy

are available from :—

B. L. J. BYERLEY,
48 Elmgrove Road,
HARROW, Middlesex

Complete volumes with covers and index

Volume 7,	1946-8	232 pp.	**21s.**
Volume 8,	1949	96 pp.	**10s. 6d.**
Volume 9,	1950	108 pp.	**10s. 6d.**
Volume 10,	1951	124 pp.	**10s. 6d.**
Volume 11,	1952	116 pp.	**12s. 6d.**
Volume 12,	1953	96 pp.	**12s. 6d.**

From

A E S, 1 WEST HAM LANE, LONDON, E.15

A E S
BULLETIN

No. 163

JULY 1954

FINAL THOUGHTS ON SCIENTIFIC METHOD

In *Bull. amat. Ent. Soc.* **10**, 105, a letter of mine was published which initiated the recent correspondence and caused the resounding controversy which we have witnessed. I wrote the letter partly in exasperation at some statements in the *Bulletin*, and partly in order to stir up the mud which I was convinced lay in the darker recesses of Members' minds, and thereby demonstrate its existence. Unaware of this motive, our Editor closed the discussion in the January *Bulletin*, but has very kindly retrenched his decision to enable me to put my own view.

What Man calls "knowledge" can really be divided into two sorts:—

(1) *Observations plus logical reasoning*, which are the only truly "known" things, as they are readily repeatable and demonstrable to anyone with the wish to understand and sufficient intelligence. This is the branch of knowledge which is arrived at by scientific method, and which it is fashionable to refer to sneeringly as "materialism", especially by those who do not understand it or have some reason to suppress it. Even so, it has certain personal associations, for every observer has to relate what he sees to his "frame of reference"—what he retains of his past experience —but it is a good working basis as it rarely lets you down, and when it does, it is only because unsound methods, information, and reasoning have been used, or the facts have been forced into appearing as the observer thought they *ought*.[1]

(2) *Supernatural beliefs*, which include religions, superstitions, and primitive "fear of the unknown". These are an attempt by Man—who is an animal that likes feeling he knows everything, however much he professes the opposite—to fill in by means of fabrications based on himself, all the gaps in his knowledge as defined in (1) above. Thus primitive—or at least, technically inept—Man sets up gods which are like very powerful persons and inhabit and control the things and phenomena he can't understand—the Sun, the Moon, fire, the sea, fertility, and so on. We now tend to laugh at this until we realise *why* it is; then we start taking a more responsible view of the situation and begin to examine our *own* beliefs, when we are horrified to discover how many of them fall into the same category.

We can, therefore, think of human thought as, say, a vast sphere of infinite size, with Man at its centre and omniscience at the outside. The parts nearest to Man, which he has explored according to (1), are his "true knowledge", and the outside space can be called "ignorance", and is filled in with prejudices, as (2) above shows. It is easy to see that the inner regions correspond to "reason", "intelligence", or "rationalism"—call it what you like, i.e., what is supposed to raise Man "above" what he is so conceited as to call "the beasts". (We are just beginning to realise that all the *other* animals possess the faculty to a correspondingly lesser degree.) That is, it is a more recent, highly specialised and adapted development as compared with the primitive, "animal", instinctive beliefs filling the "outer darkness". It is also easy to see that throughout Man's history, as his scientifically obtained knowledge has grown, this outer region has been pushed into further and further; and that, as the supernatural beliefs are primitive and instinctive, and therefore automatic, very deep-rooted and hard to break, new scientific knowledge has always been very unpopular with people holding them, as the new knowledge always seems to have been at variance with the primitive beliefs.

Now that we know what we're talking about we can go on to consider a few examples, to consolidate our understanding. We are, nowadays, quite clear about our explanation of the Moon as a satellite of the Earth; of the Sun as a star of which the Earth itself is a satellite; of fire as the luminous nature of very fast-vibrating electrons in the molecules of the gases produced in the chemical reaction called loosely "burning", and due to the release of energy when that reaction takes place. Bodily disorders are a more recent realisation. They were originally held to be the effects of the influence of evil spirits which were supposed to have taken up residence within the body. With the

greater scepticism of the Greeks, the spirits became "vapours", and so they remained until Louis Pasteur showed that the diseases were often accompanied by the presence of minute organisms—Bacteria. Others are now known to be caused by the activity of Protozoa, and many are still being attributed to "Viruses"—a rather loose term covering several different sorts of thing and phenomenon. Even to-day, many of those disorders affecting the working of the brain, so-called "madness", mental disorders, criminal tendencies, and sexual variations, are still believed by most people to be due to something akin to an evil spirit—a "twisting of the personality".

It is interesting to note that the things to be explained first were mostly actual objects, whereas most of those remaining unexplained are phenomena, or processes. A few of these are Life, Magnetism, Electricity, Gravitation and Light. We can describe the manifestations of these, but cannot *define* them. In all probability we never *shall* be able to define them, not on account of our inability to understand them, but as a result of our method of naming, or applying labels. When all's said and done, the use of a noun, or a name, is just a shorthand way of referring to a "something" which would otherwise have to be described at great length each time it was referred to. The trouble is that the same sort of noun is applied to both *things* and *phenomena*. It is most important to realise this, because, as a result, great confusion exists over the distinction between the two: when we first learn to use words, the first ones we are taught are invariably nouns—labels for people and things,—and it is only later that we begin to learn nouns which are labels for phenomena (i.e., the manifestations of processes). As a result we tend to think of phenomena as having an entity, i.e., as things. This is why most people are unable to understand how we cannot define, say, Life or Electricity: they are of a kind with what we call "properties", such as movement, heat, and so on. We cannot define these: we can only describe their manifestations, yet we feel we understand them, for they are much simpler and more immediate to our own order of existence than are the hitherto unexplained ones.

The lengthy preamble above was necessary purely as a result of the last point made—that we must be absolutely clear as to the nature of what we are talking about, before we say it. Before we discuss, we must define our terms, apply our labels, i.e. names, so that other people also can know what we are talking about.

Our actual scientific method, then, consists of the following processes:—

(1) observing the appearance of *things*;
(2) describing the *things* we observe and naming them, so that, when we have enough things named, we can set about:
(3) observing the *processes* involving the things, i.e., observing *phenomena*;
(4) describing and naming the *phenomena*, exactly as we *see* them, without even hinting at explanations, until we have enough named phenomena to be able to set about:
(5) collecting up our descriptions (a) of things, and (b) of phenomena, separately, to examine each type for similarities and differences, i.e., to compare and contrast them, so that we can begin:
(6) classifying them, so that from (5a) above, we arrive at some sort of systematic arrangement, or taxonomy; and from (5b) we can seek similar phenomena in similar circumstances elsewhere.

We must be quite clear, then, not only in our own minds, which is difficult enough, but also in our conversation and, still more, our written reports, into which of the above categories each of our statements falls, and on no account must we misrepresent the nature of a statement. We must, therefore, make it quite clear in our account, which statements are purely descriptive, which are descriptive of things and which of phenomena, which are attempts at explaining what we see in terms of our past experience, i.e., interpretations, and which are purely conjecture, i.e., statements of belief.

Of course, in actual fact, *all* our statements are of belief, in that we believe that our senses tell us the truth about the nature of things at our immediate level of perception. Further, *all* our statements, unless they are direct quotations, are the result of comparison with our own personal past experience, but with our present limited methods of conveying thoughts one to another, all of which involve such comparison, there is only a limited field in which we can be at all precise—this is what I mean by "immediate to our own order of existence" and "at our immediate level of

perception". As we get used to these more immediate things, which all had to be discovered by our scientific method, so we use them as instruments, or extensions of our senses and our limbs, to investigate the next order of things, using the same method; and so on.

Even when we have built up a conception of the nature of things, whether on the grand scale or in our field of work, we must bear in mind that it is only a working hypothesis, and not allow it to get such a strong hold on us that it appears infallible—it then becomes a creed, whereupon all possibility of advance ceases.[2] We must be prepared to accept that we are barking up the wrong tree, however difficult and bitter this seems.

Briefly then:—

(1) Describe what you see.
(2) Keep interpretations separate and make it clear that that is what they are.
(3) Remain willing to be wrong.
(4) *Never* "stick out" for your own ideas in the face of reason.
(5) *Never* appeal to the emotions.

So you see, "Scientific Method" is *not* a set of Rules laid down by the pundits for the guidance and discipline of lesser mortals, but merely our old friends common sense, caution, accuracy and above all, humility, the necessity for which has been discovered through long years of disappointment, humiliation and wasted effort. **Peter G. Taylor** (719).

Bibliography.

[1] Johnson, M. L. "Seeing's Believing" in *New Biology*, **15**, 1954.

[2] Polanyi, M. "The Nature of Scientific Beliefs" in *Sci. Journ. Royal Coll. Sci.*", **20**, 1949.

PRACTICAL HINTS — JULY

The two most productive methods of collecting will again be with 'Light' and 'Sugar'. Newcomers to the use of mercury vapour lamps as a means of attracting moths should be careful not to become over-enthusiastic. Species which previously seemed scarce will probably come in fair numbers, so don't take more than you really require; in many cases it is possible to get one female, and breed a dozen or so first class specimens for the cabinet. By so doing you will learn more about the early stages and provide a series of perfect insects.

Beat Oak for fully-fed larva of *Polyploca ridens* Fab. (Frosted Green). The larva feeds by night and rests by day on the underside of the leaf, frequently in a fold held by strands of silk. *Achlya flavicornis* Linn. (Yellow Horned) on Birch will be in the last instar. Look also for *Drepana falcataria* Linn. (Pebble Hook Tip). Females of this species are frequently found sitting on the leaves of low growing plants—Dog's Mercury, etc.—near birch trees. They deposit ova freely and the larvae are very easy to rear.

Hemistola immaculata Thunb. (Small Emerald) is another easy species to breed. Females may sometimes be obtained by beating the foodplant—Traveller's Joy (Old Man's Beard). The larvae hibernate in the autumn and should be supplied with a few bunches of the feathery seedheads of the plant; into these they will conceal themselves for the winter months. The experiences of Mr. B. S. Goodban and myself, lead me to think that this species will come through the winter better if kept in a well-ventilated cage in an unheated room indoors, rather than in a garden shed. Last winter, using this method, I have had almost 100% come through safely.

Cucullia gnaphalii Hb. (Cudweed Shark) larvae may be found feeding on Golden Rod from the end of July to the end of August. This, of course, only applies to those fortunate enough to be able to collect in the haunts of this local species, Kent, Sussex, Surrey, etc.

The larvae of *Vanessa atalanta* Linn. (Red Admiral) may be found by searching beds of stinging-nettles; those growing in shady lanes seem to give better results. Unlike *Aglais urticae* Linn. (Small Tortoiseshell), the Red Admiral larva lives a solitary life, and folds a leaf over with strands of silk. When the leaf has been half eaten he constructs a new abode.

Beginners will probably find general beating for larvae quite interesting. It is advisable to confine one's attention to one particular tree, for instance you could probably spend an afternoon beating oaks, and another at hawthorn, or lime, and so on. By this method one obtains a goodly assortment of larvae, the foodplant of which is known, since there is no chance of putting oak-feeding larvae in with the lime feeders, etc. In some cases, knowledge of the foodplant is an aid to identification. *Plusia bractea* Schiff. (Gold Spangle), *Plusia festucae* Linn. (Gold Spot) and other Plusias visit the flowers of thistle,

valerian, etc., at dusk. 'Dusking'—as the method of capturing insects on the wing at dusk is called—can be a most productive means of collecting. Many species which do not visit 'sugar', or are rarely attracted to light, may be captured.

Boxes used for egg-laying females should be lined with blotting-paper. The moth usually deposits her eggs on this quite freely, with the result that they are easy to handle or despatch by post to friends. I frequently use a 3″ glass-bottomed collecting box for this purpose, and during the winter strips of blotting-paper are cut up together with a supply of circles to cover the lid. These are then ready to insert into a box each time a female is enclosed therein. R. V. Aldridge (262)

ANOTHER JUNIOR MEMBERS' NUMBER

The Junior Members' Number published last November was such a success that it has been suggested that there should be another this year.

As an incentive for younger members to observe and record their findings, one issue of the *Bulletin* will be entirely devoted to the contributions of juniors, if sufficient material of suitable quality be sent to the Editor by 12th September 1954.

Drawings should be in black Indian ink on white paper, and twice the width they would appear if used in the *Bulletin*. That is 4⅕″ wide for reduction to single column width.

S. M. Hanson (320),
Youth Secretary.

REARING *HELIOTHIS PELTIGERA* SCHIFF.

For the last three seasons I have collected larvae of this species from *Senecio viscosus*, and have found that beating produces better results than the most careful searching. During the first two seasons I found that about a third of the larvae died during pupation. The remaining two-thirds, which were sound pupae, were transferred to my puparium, a box with a glass top, ventilated at the sides, and with a thick layer of peat and sand at the bottom. During both these seasons no imagines were forthcoming; all pupae had died. During the third season, however, from twenty-eight larvae, twelve sound pupae were obtained. These were transferred as before to the puparium and left until February, when I removed them to a smaller box, heated with a 15-watt bulb. After ten days I had my first emergence, and then during the following seven days six more came out making seven in all. The remaining five pupae were dead, and on breaking them open I found the partly formed moths inside. 'Forcing' certainly gave me better results than waiting for natural emergence, and I should be interested to know of other members' observations of this species. G. Eade (140).

GARDEN ECOLOGY

Making a collection, and finding out the names of all insects found in a definite area of land, can give great interest and instruction. Some of my spare time, and that of my family, has been occupied for several years in making such a collection from our garden. This occupies about one acre of Boulder Clay in South Norfolk. There are fruit and forest trees, and bushes, and a very varied selection of herbaceous plants. Two ponds enable us to include aquatic insects. Most of the insects are pinned with fine steel pins and mounted on polyporus. The following list shows the number of species of the various Orders so far collected.

Thysanura	1
Collembola	1
Orthoptera	3
Dermaptera	2
Ephemeroptera	1
Odonata	4
Psocoptera	4
Thysanoptera	1
Hemiptera	34
Neuroptera	2
Mecoptera	1
Trichoptera	1
Lepidoptera	111
Coleoptera	112
Hymenoptera	44
Diptera	70

H. Riley (1819).

LETTERS TO THE EDITOR

TRANSMISSION OF VIRUS DISEASE

W. J. B. Crotch (1181) writes:—Members will not have forgotten the article on "Caterpillar Viruses" which Dr. Kenneth Smith, F.R.S., wrote specially for the Bulletin last year (*Bull. amat. Ent. Soc.* **12**, 57). Dr. Smith was disappointed that so few members sent him diseased larvae to diagnose; so when I ran into trouble this year I had no hesitation about taking up his time.

Some perfectly healthy looking ova were laid as a result of a further

cross-pairing of *Philosamia cynthia* Drury (Saturniidae) and there was 100% emergence. But after five or six days all the little larvae were releasing their hold on the leaves, falling and dying. I put a dozen of these larvae in a quill and sent them to Dr. Smith, explaining that they had been kept as ova in an old glass-topped tin which I had not suspected of infection, and that as larvae they had spent the whole time in a brand new plastic container.

It may be of general interest to quote from Dr. Smith's reply:—"They died of a polyhedral disease of the nuclear type. From the small size of the larvae, I would suspect that the virus had been passed on from the parent insect. In some of these congenital viruses, it is possible that the virus adheres to the outside of the egg . . . . and with valuable eggs it might be worthwhile sterilising them on the off-chance that virus might be on the outside. If you want to take the trouble, the treatment is to soak the eggs for one to two minutes in 2% sodium hydroxide; wash for about an hour in running water; finally put them for fifteen minutes in a very weak solution (0·01%) of potassium permanganate. The foregoing formula was published in *Microbiologiya* (1953, **22** (3), 311-5) by L. M. Tarasevich."

COLOUR VARIETY OF THE RED ADMIRAL (*VANESSA ATALANTA* LINN.)

From S. G. Castle Russell (119):—With reference to Mr. D. J. Stradling's contribution on above in *Bull. amat. Ent. Soc.*, **13**, 58, he may be interested to learn that a number of these abnormally coloured forms of this species have been seen and captured and recorded, but they are rare. The bands on the fore and hind wings may be white, cream, or pale yellow. Two fine and perfect examples have lately been presented to the National Museum at Tring by Dr. E. A. Cockayne, the Editor of the *Entomologist's Record.* Mr. A. L. Goodson, the Curator, would, no doubt, be pleased to show them to Mr. Stradling (or any other member) if he would make an appointment.

Some years ago I saw a white banded example sitting with its wings open on a platform at Woking Station as I alighted from the first carriage behind the engine. The arrival of the engine did not seem to alarm it, and I had a close view until the train moved off, when it flew away. It was useless to make any attempt to catch the insect.

A very much rarer form with the red band on the forewing entirely absent was seen, but not caught, in the Rector's garden at Romsey Abbey some years ago and a description given to me. I have never heard of a similar form.

SOME INTRIGUING PROBLEMS
4

After the race of *Eumenis semele* Hübner (Grayling) which inhabits the Great Orme in Caernarvonshire had been given sub-specific rank and named sub-sp. *thyone* Thompson doubtless many entomologists paid the locality a visit so as to obtain a short series for their collections. I myself did so, and saw the insect on June 25th, 1947, and again on June 28th, 1950. On the first occasion males were quite frequent but females were only just appearing; on the second occasion the insect was well out. Now *E. semele* is a common insect on the limestone in South Westmorland, and the surprising fact which I have discovered is that all over this area, but more noticeably in some colonies than in others, specimens frequently occur which are quite indistinguishable from specimens occurring on the Great Orme. Such specimens are particularly frequent on Hutton Roof Crag and I have examples in my collection which I am unable to separate from Great Orme specimens, except by their labels. I have seen many more than I have taken, of course, as I have only kept a very small sample. Not only are these specimens as small as Great Orme specimens, but their markings are identical on both upper and under surfaces.

In South Westmorland the size of the specimens is, however, much more variable than on the Great Orme. Furthermore, the time of appearance is very protracted. It begins to appear strikingly early (18.6.49, 29.6.51, 27.6.52, 24.6.53) and one or two fresh specimens can be usually found even in mid-August. It reaches its climax, however, about the second week in July. I have examined very many specimens in this area and my impression is that this may well be a mixed population. If Professor Beirne is right (*The Origin and History of British Fauna*, p. 105) in thinking that sub-sp. *thyone* represents the descendants of a population which survived at least the last phase of the final glaciation in a sheltered place to the west of the present coastline,

which he calls the Cambrian Land, it is also highly probable that with the retreat of the ice and the consequent rise of sea level, the insect would have spread into N.W. England as well as into N. Wales. The post-Glacial invasion of the typical sub-species would have spread northwards and met the survivors of the previous inter-Glacial population. Being more numerous and being capable of being reinforced from the South they would have largely absorbed the smaller, weaker population. I strongly suspect that this is the explanation of the situation which exists at the present day in the South Westmorland limestone area, and I should think it highly probable that a similar situation exists in other areas as well, and would be discovered if careful examination were made of colonies in likely places. Why the inter-Glacial race has not been absorbed on the Great Orme I cannot imagine, and this certainly presents a strange problem.

The post-Glacial race occurs nearby and emerges, of course, considerably later, but seems to have avoided the Great Orme. The particular inter-Glacial race which we have been considering is a limestone race, and I know of no sandstone or heathland race which presents quite the same problem, but some of these races may be mixed races as well, for many heathland races of other species seem to have survived the final glaciation. The local variation of *E. semele* suggests that this may be so, more particularly along the West coast. The theory here suggested is, of course, just a theory and may be absolutely wrong, but it does offer a possible explanation of the striking similarity between Great Orme specimens and many specimens from South Westmorland. It doesn't attempt to explain why sub-sp. *thyone* on the Great Orme has not become mixed with the typical sub-species. But whether the theory is right or wrong, it in no way alters the fact that it is well worth while paying much more attention to colonies of this species than has been done in the past. Many more strange problems might well appear if this were to be done, and fresh light might be thrown on the history of this very interesting butterfly. J. H. VINE HALL (1520).

REPORT ON THE ELEPHANT HAWK MOTH INVESTIGATION

A return of 1½% may not be a good business proposition, but I believe that in the case of the investigation into the incidence of the Elephant Hawk Moth as suggested in *Bull. amat. Ent. Soc.,* **12**, 53, such an interest is quite satisfactory. Anyone who has endeavoured to arouse an interest in any subject in the breasts of large numbers of people knows what a lot of seed falls on stony ground, and when the subject is narrowed down to a single species of insect, the task becomes increasingly difficult and less fruitful. It is probable that half the members of the AES lost interest in *Deilephila elpenor* Linn. long ago, and of the rest it is possible that few will wish to do more than place a series neatly in a drawer of a cabinet and then forget it; so when twelve people were interested enough to reply I was quite encouraged. Although only three people carried out their search in the manner described in the article mentioned above, as absolutely necessary to make the experiment worthy of the name scientific, here again I am encouraged rather than dismayed. How many amateur entomologists have had the requisite grounding in the methods of scientific research, or are even desirous of obtaining such an addition to their accomplishments? I imagine that the majority are mainly interested in where and how they can obtain the insects which appeal to their tastes. I am not blaming them. It is necessary to learn the techniques of collecting and to build up a collection before any advance can be made. The few who have passed the stage of mere accumulation of specimens will for the most part have their own special lines of thought to pursue, and will not have the time to help in the simple little research which I am attempting to initiate, although I tried to arrange it so that the minimum time was required of those taking part.

I am, therefore, extremely grateful to Mr. Pringle (2094), Mr. Goide (2216*) and Mr. Cornes (2126*) for their excellent work. They have stimulated me to maintain the investigation which I am convinced is the kind of work which some members of the AES could carry out successfully. Similar surveys are often carried out by students at Universities and Colleges, but the results have a tendency to be buried in some thesis or journal where the amateur has no chance to see them. Occasional articles, such as "On animal and human populations," by F. S. Boden-

heimer in *Science News*, **30**, and "Animal Populations and their Regulation," by J. B. S. Haldane in *New Biology*, **15**, which are based on the surveys made by students, may stimulate the reader to action, but very often he is prevented from further progress by lack of relevant information, equipment and encouragement. Here is where the AES could supply the desiderata. It is the main purpose of the present attack on the Elephant Hawk Moth. Perhaps I should have chosen an insect of more economic significance, something like the Crane fly, but the experts are already greatly concerned with such creatures. That is their work: we need not be tied to any completely utilitarian motive. If we can arrive at some easily applied method of measuring accurately the fluctuation of any one species of insect under completely feral conditions, we shall have taken a slight step towards understanding the causes of such population fluctuations. At least we shall have moved out of the estimating stage which, in 1933, Elton described as a useful statistical method of working out animal populations, since no better one was known.

Now to examine the results of a co-operative effort of the AES, for any trace of success. Mr. J. P. S. Pringle searched two separate areas of wasteland, one known as Radlett Brickfields, the other Bluebell Wood. He searched both of these well-selected habitats for one hour on different evenings. In the first place he found 6 larvae in the hour between 5.0 and 6.0 p.m. on August 26th. He searched the second on August 27th without finding one *elpenor* larva. Although this lone observation does not *prove* that *elpenor* is more attached to industrial wasteland than to rural woodland, it does add a little emphasis to my own observations, and to those of D. F. Owen in "A further analysis of the insect records from the London bombed sites," (*Ent. Gaz.*, **5**, 58). This habitat-preference problem might be a suitable project for some school which is situated close enough to bombed or industrial sites, and country districts, for regular surveys. It is by no means certain that *elpenor* does prefer built-up areas before wild woodland; it may be that the large larva is more easily noticed in places where the herbage is not so thick. The results from the captures in two Mercury Vapour Light Traps seem to prove that *elpenor* imagines are fond of rural dwellings Mr. P. Maggs (244) very kindly gave me a list of Elephant Hawk Moths taken in a Robinson type M.V. light trap operated at Sway in Hampshire. Between May 23rd and July 6th he obtained records of 65 *elpenor* imagines; some may have been recaptures. This trap was situated a short distance from the New Forest, which is still a rural area, I believe. In my own trap, which is situated in industrial territory, I took only 11 *elpenor* betwen June 10th and July 10th. I can only give these two figures, I am sorry to say; if we had more records from regular M.V. light trap operators in different parts of England, we should be able to give a more satisfactory picture, I have no doubt.

P. Goide (2216*) found 3 larvae in the hour at Woodford Green, Essex, the first one in 18 minutes. M. A. Cornes (2126*) found 2 larvae in the hour at Burton-on-Trent, Staffordshire. These figures are similar to my own results of 2 and 1, recorded *Bull. amat. Ent. Soc.* **13**, 15. If we work out the average of these results we arrive at the figure of 2·3, which gives a slight indication of the degree of abundance of the Elephant Hawk Moth in England in 1953. Of course, many objections may be levelled at this result, but at least it is the result of co-operative effort and will be available for comparison next year and any other year. If more people had co-operated, then the results would have been that much more useful. At any rate, it indicates what can be done.

Mr. Rogers (2049), Mr. Pearson (2193) and Miss Woudstra (1948*) reported that *elpenor* is absent from Braintree, Essex, Portsmouth and Bournemouth respectively. I made an enquiry in *The Entomologist's Record*, but received only one reply. This silence may indicate that the reports are true.

Reports were also received from A. G. Gripper (1836), J. Grace (2097), Miss B. A. Hopkins (827), H. F. Tebbs (1897), and John F. Reid (1821). I am grateful to these members for their help.

I should also like to thank Mr. Peter G. Taylor (719) for kindly pointing out to me the serious defects in the organisation of the experiment. Firstly, in some districts, *elpenor* larvae prefer Orange Balsam, *Impatiens biflora* Walt., to Rosebay Willowherb, *Epilobium angustifolium* L., as a foodplant; in others Codlins-and-Cream, *E. hirsutum* L., is the favourite. Mr. Taylor declares that he has seen instances of this in

his own district. Mr. P. B. M. Allan states in *A Moth-Hunter's Gossip,* p. 51, that he found the *elpenor* larvae more frequently on *E. parviflorum,* and in *Larval Foodplants* he omits *E. angustifolium* from the list of plants used as foodplant by *elpenor*. In this event, any survey which is based on the number of larvae feeding on any one species of foodplant is bound to be false. The solution is simple: in the hour's search, every possible *elpenor* foodplant must be included, although I always assumed that anyone searching an area for *elpenor* larvae would count those found on grass or soil or any other resting place, but would make a careful note of the phenomenon. Secondly, Mr. Taylor points out that the number of larvae found depends on the skill of the searcher. This, alas, is true enough, but we must all do our best. I was nonplussed to find that a boy had found 43 *elpenor* larvae in one day, while a friend who is not an entomologist found 28 on the morning of September 16th before 7 o'clock in about 30 minutes or so. Neither of these results was of any value to my scheme; in fact, they were detrimental in so far as they removed the raw material of my experiment. This kind of interference is inevitable in a country like England, but human beings are ecological factors just as much as rainfall and rabbits, and must be taken into consideration. Indeed, human beings will soon be *the* ecological factor as cultivation and urbanisation spread over the entire country. The amateur will be able to play a valuable part in making a record of these changes if he is both willing and able to carry out the following instructions without the slightest deviation. Unfortunately every amateur is not able to work as he would like, therefore each person will introduce his own modifications. Even so his observations may be of value. The following suggestions are put forward in an attempt to show the amateur how his labours may be made valuable additions to the body of scientific knowledge.

1. Operate a Robinson type M.V. light trap in a suitable locality from dusk to dawn every night from May to October.
2. Make a complete list of every moth taken therein (name, variety, sex) as far as possible. (N.B.—If it is impossible to purchase a Robinson trap, a home-made trap is easily made. I will send details to anyone who asks me. Ordinary electric lamps are quite satisfactory).
3. Publish the list in an entomological journal or make an announcement that it is available to anyone who wishes to consult it. (I need not stress the labour involved in making this kind of list, but it is within the power of any naturalist worthy of the name, and the result will be important.)
4. Select an area, or several areas, where any of the usual foodplants of the Elephant Hawk Moth flourish.
5. Search these areas by some standard method for *elpenor* larvae. Either search an area of ten square yards assiduously so that every larva is discovered or search a wider area for *exactly* one hour. This depends on the temperament of the individual searcher. If one search could be made standard throughout the country it would be easier to compare the results. For instance, if everyone interested searched their area on August 28th from 7.0 to 8.0 p.m. and recorded his results we should have some interesting data.
6. Record exactly in detail what larvae were found (size, colour, when found, etc.).
7. Rear the larvae to maturity and record how many were green up to the time of pupation, and how many were ichneumoned. These are important details.
8. Write an essay or report on the season's experiences on the above 7 points, with particular reference to the Elephant Hawk Moth.
9. Send the essay to the Editor of the *Bulletin* who will publish the best and award a suitable prize to the writers.

J. H. Johnson (1040).

[The above report clearly indicates that some progress was made in the investigation of the Elephant Hawk Moth during 1953.

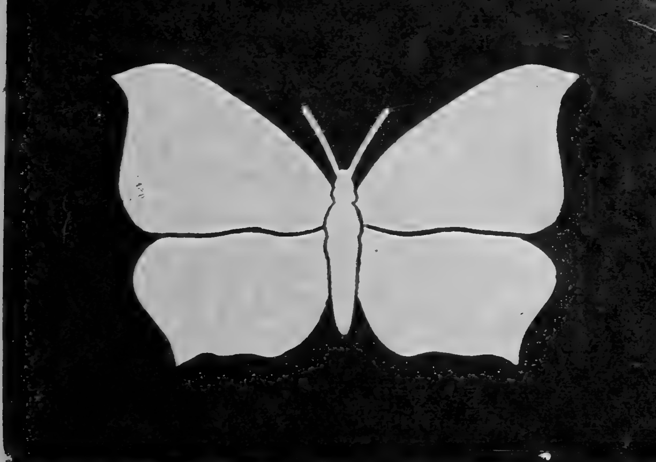
The suggestions put forward by Mr. Johnson for 1954 would be well worth while carrying out, and although this is not a competition in the usual sense of the word, he has kindly offered "set" insects as prizes for the best reports.

It is hoped, therefore, that this incentive will encourage members, especially juniors, to make a special effort this year to find out more about the life history and distribution of one of our most beautiful moths.—Ed.]

VOL. 13

No. 164

G ST - - 1954



THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

EDITED by B. R. STALLWOOD

AES BULLETIN

No. 164

AUGUST 1954

THE LITTLEWOOD PUPA-CAGE

I.

The primary essential for constructing a Littlewood Pupa-Cage is a box with a glass lid. True, it contains certain vital appurtenances; but, I repeat, the primary essential is simply a glass-lidded box. Therefore, it matters not at all whether you provide a glass lid to a box which was a former receptacle of tinned foods, which you have obtained from your grocer for sixpence, a wine-case supplied by your vintner which cost you a shilling, or a highly polished walnut museum piece once used as a work-box by Queen Elizabeth, Marie Antoinette or the Empress Catherine of Russia, for which you paid five hundred guineas. Personally I prefer the grocer's variety; but it is all a matter of individual preference, and finance.

The size of the box is, within limits, immaterial. The limits are set by (*a*) portability; therefore it should not be too heavy; (*b*) congruity with its environment—your wife will not appreciate a box as big as a full-size coffin in the sitting-room; (*c*) sufficiency of depth to contain the appurtenances and have plenty of room for the moths emerging from your largest pupae, *e.g.*, Death's-Heads, to expand their wings in comfort. The last pupa-cage which I made measures 20 inches from left to right, 13 inches from front to back, and 9 inches from top to bottom. Before its elevation in rank it was used, so far as I remember, to transport certain products of Mr. Heinz.

The glazed lid must be hinged at the back and it must fit well and truly—not tightly but decorously. A lid that lifts off bodily is never satisfactory because it will not always be replaced dead level and very slowly and very gently, all of which measures are desirable. The glass should be without flaws—such as is used by picture-framers.

All round the walls of the box, inside, and one inch below the glass, is nailed (with short brads) a narrow beading just wide enough to form a little shelf for supporting a tray. 'Tray' is not a good word to use, for this consists only of a frame of very narrow wood over which is stretched (and glued) black veil. (See fig. 1.) But Littlewood and I always referred to it as the 'tray', so perhaps the word may as well stand. When this tray is *in situ*, plainly no moth can escape even if the glass lid be left wide open. A tiny knob at each extremity will enable you to lift out and replace the tray.

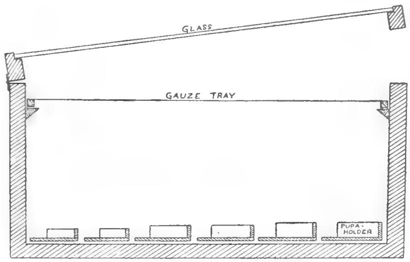


Fig. 1

The material which covers the tray *must* **be black, for** only black is sufficiently invisible for your purpose, which is to be able to look through it and inspect the moths within the cage. It must be exceedingly thin—the thinner the better—and quite the best stuff for the purpose is the material which women pull over their faces at funerals. This material is so invisible when the tray is *in situ* that it is necessary to stretch (and glue at either extremity) a piece of thin white tape across the middle of the tray. If you don't do this you will, sooner rather than later, put your hand through the veil.

Along the front and back walls of the cage, just below the tray, are bored three one-inch-diameter holes, equidistant from each other and from the ends of the cage. These holes are covered, on the inside of the cage, with the finest perforated zinc you can obtain. For heaven's sake, let it be fine, otherwise small spiders, even tiny hymenoptera, not to mention mites, may get in. On the outside, each hole can be closed at will by a penny which rotates about a small screw near its circumference.

Now for the appurtenances. These consist of (a) water-trough, (b) 'slats', and (c) pupa-holders.

The water-trough is on the floor of the cage, amidships, and it extends from front to back. It is made of copper or zinc (not tin, which rusts) and it is a channel, square in section, one inch high and one inch wide. In the simplest form of pupa-cage the water-trough just fits nicely (not tightly) across the cage, and one refills it, when necessary, by means of a cream jug. But if you are a bit of an engineer you will probably arrange things so that you can replenish the trough from outside the cage. This is a great improvement, for not only does it obviate opening the cage and taking out the tray and lifting the cover (about which in a moment) off the water-trough, but it does away with the ever-present danger of spilling water on the floor of the cage if you have to replenish the trough with a jug. However you contrive things it is essential that the trough be fitted with a perforated zinc cover (large perforations this time); if you leave this cover off at any time it is ten to one you will find your choicest specimen drowned in the trough. If the trough can be refilled from outside the cage this cover can of course be a fixture.

If you are in the habit of moving your pupa-cage from one place to another it is a sound plan to fill the water-trough almost full of silver sand and add water until the surface of the sand is just awash. Then there will not be so much danger of water being spilt.

Slats of thin wood, each about 2⅛ inch broad, cover the floor of the cage on both sides of the water-trough, their long axes being at right angles to the trough. (See fig. 2.) The length of these slats is determined by the size of the cage, *i.e.*, the distance between the water-trough and the end walls. To these slats are fixed the pupa-holders or artificial cocoons into which, in due course, you will put your pupae.

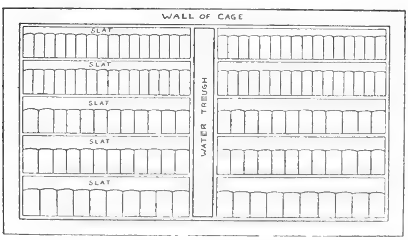


Fig. 2

Floor of cage viewed from above

At the back of each slat, as can be seen in Fig. 1, there is nailed a thin strip of wood just high enough to close the back ends of the pupa-holders. To this strip is affixed, on the pupa-holder side, a piece of cloth in which species that have cremasters can entangle these structures and thus 'anchor' their pupa-case, so that the emergent moths can crawl forward and leave the pupa-cases behind them.

Now for the pupa-holders, and as these are somewhat complicated, and nothing is more boring than a long verbose account of how to make anything, I must beg our Editor's permission to describe them in a further article.—P. B. M. Allan.

PRACTICAL HINTS—AUGUST

Your "sugar" patches should yield good results this month. During the first week, *Leucania lithargyria* Esp. (The Clay), *Amphipyra pyramidea* Linn. (Copper Underwing), and *Amphipyra tragopogonis* Cl. (The Mouse) will be frequent visitors.

Dig round oaks in open places—parks, roadsides, etc.—for pupae of *Dryobota protea* Schiff. (Brindled Green) and *Griposia aprilina* Linn. (Merveille du Jour). Both are usually found in fair numbers.

Beating and searching for larvae is very profitable throughout August. Many of those taken will be almost fully fed, thus causing little trouble before turning to pupae. (Of course, as you progress with your hobby, you will want to breed your moths right through from the egg, in order to study their habits; in the meantime, collecting larvae at random provides an introduction to breeding). Some of the best trees are Oak, Birch, Hawthorn, Blackthorn, Willow, Sallow, and Lime. Beating or searching these will soon fill your cages.

Sweeping heather will produce larvae of *Anarta myrtilli* Linn. in areas where this insect occurs. More widely distributed is *Eupithecia nanata* Hb. (Narrow Winged Pug), which feeds on the flowers of heather during late August. The flowers of Burnet Saxifrage will yield larvae of *Eupithecia pimpinellata* Hb. (Pimpinel Pug) from the end of the month into September.

Though so small in size, these pug larvae are not difficult to rear; in fact, I, personally, would suggest that

many noctuids would present more difficulties than most of the pugs.

Moths on the wing this month include:—

Gortyna flavago Schiff. (Frosted Orange).
Mormo maura Linn. (Old Lady).
Luperina testacea Schiff. (Flounced Rustic).
Tholera popularis Fab. (Feathered Gothic).
Cryphia perla Schiff. (Marbled Beauty).
Chiasmia clathrata Linn. (Latticed Heath).
Selenia tetralunaria Hufn. (Purple Thorn).
Deuteronomos fuscantaria Haw. (Dusky Thorn).

The 'Blues', *Lysandra coridon* Poda (Chalk Hill Blue), *Aricia agestis* Schiff. (Brown Argus), *Polyommatus icarus* Poda (Common Blue) and *Lysandra bellargus* Rott. (Adonis Blue) will be found on the chalk hills. The Adonis Blue seems to be scarcer in recent years and, in view of this, over-collecting should be avoided.

Sweep or search Golden Rod and Sea Star-wort, for larvae of *Cucullia asteris* Schiff. (Starwort Shark). Although mainly inhabiting the southern seaboard counties, this species may be found inland in several areas such as Wiltshire. *Cucullia lychnitis* Ramb. (Striped Lychnis) larvae may be found on Black Mullein.

For those who are on holiday at the end of the month, *Agrotis ripae* Hb. (Sand Dart) larvae are to be found in fair numbers by searching under plants of Sea Rocket, Sea Holly, Saltwort, etc., on the sandy shores. Provide plenty of sand for the larvae to burrow in, and feed on sliced carrot. When fully grown it goes well down in the sand but does not pupate until the spring.

R. V. Aldridge (262).

SPRING BUTTERFLIES IN NORTH KENT

Although we had just come through a winter of rather varied weathers, following one upon another, I was pleasantly surprised to find Small Tortoiseshells (*Aglais urticae* Linn.) coming out of hibernation on March 11th, which was a sunny, clear day in North Kent. A naturalist friend had seen a battered Small Tortoiseshell flying around a workshop in Chatham Dockyard on March 9th.

The place of hibernation, the only one I could possibly find, in a cupboardless, disused, and completely bare upstairs room in a relative's house, was apparently up the chimney or surround of the fireplace. I found three in this room myself, and a daily help found one flying about on the stairs, all on 11th March. Being in a dirty and battered condition they were released. On 13th March, another warm day, I captured another two in this room, but these were the last.

Last Autumn the window had been left open to air the room, and the Small Tortoiseshells being very plentiful, and the next-door neighbour having a large clump of michaelmas daisy in his garden, it is obvious how they came to be where I found them. Unfortunately for them when their sleeping time was over their way of entrance and escape was closed to them.

The first Small Tortoiseshell I actually saw in the "wild", battered and presumably hibernated, was at Hartlip, Kent, on 21st March. A few more notes probably of interest: Comma (*Polygonia c-album* Linn.) in flight near Bredhurst, 25th April; my own first male Brimstone (*Gonepteryx rhamni* Linn.) record this year, 29th April, completely out of place flying along busy, traffic-crowded Watling Street, Rainham; Garden Tiger (*Arctia caja* Linn.) larva on dandelion in Rainham garden, 11th March.

Alan P. Major (1117).

THE DOODLE-BUG

1944 was the year when the V-1 came over the South-East Coast in some numbers. It was also the year when *Argynnis cydippe* Linn. (High Brown Fritillary) was varying from the type. When I was looking over a large colony a var. *bronzeus*, an extreme melanic form, was captured, which I think you will agree, after reading the story, is well named the 'doodle-bug'.

My first *cydippe* aberration was a nicely banded male, and a heavily barred forewing ab. *charlotta*. This was followed three days later by an extreme *charlotta*, which I think might be termed *'ultra-charlotta'*. It was a very windy day with not much sun and the insects were flicking away from the position they had taken up on the bracken, as one approached. In one spot there were 8

or 10, all parked with outstretched wings—a lovely sight. As I got near, they all arose, except one. That one was a strong ab. *confluens* (spots joined forming strips) on the hind-wings. As I approached with extreme caution, he considerately held his ground until, within striking distance, he flew off into a quickly interposed net.

Continuing for a further quarter mile, to what was the best place in the area, it was disappointing to find so few there. Turning for home, my eye caught sight of a blackish looking insect perched on a bramble blossom. I realised—after the initial surprise—that it was a female var. *bronzeus*. The net was nearly over her when she moved and flew off and rested, I couldn't see where. Moving very gingerly, because the slightest thing disturbs these insects, and when the hidden sun at last consented to gleam through for a few seconds, she flashed past with a *Maniola jurtina* Linn. (Meadow Brown) chasing her, no doubt thinking it a female of its own species. Over the trees they flew into another clearing, and there settled. Once again I crept up, but another Meadow Brown was before me and off my 'doodle-bug' went again. Would she stop before the trees? Yes, she halted in the very far corner on the ground. Again creeping up slowly, using every scrap of bush as a camouflage for my movements, I managed to crouch over the prize, and had the net just over her, slowly lowering it. Eighteen inches away she took fright, and was up and over the trees. I waited for about two hours, but the sun was fitful, and no more of the butterfly was seen before I had to return home at 6.30 p.m.

The next day weather prospects looked hopeful, but by the time I got on the ground the 'blanket' had clamped down, and comparatively few insects were seen. The two following days were wet and no collecting was possible.

The fifth day should have been a red-letter one. The second insect seen was the *bronzeus*; she was in, and around some high birch trees and was difficult to follow. At last she settled on a bramble bush, waist-high, about five feet in. Moving at a pace which would have shamed a tortoise, I at last got near enough to strike; at once she moved a further two feet in. Continuing the process—with some difficulty—I managed to get the net vertically overhead, and then, like a lunatic, I clamped it down quickly. Down went the insect through the bramble, and up again and away. I managed to get the net free from the thorns and swooped at her as she went—and missed! Searching long and arduously for the rest of the day was all to no purpose. All I secured was a *paphia* ab. *confluens* which obligingly came and perched in front of me. Well! Well! I deserved to lose it.

On the sixth day I was on the ground by 9.45 a.m. It looked like coming out fine as the day progressed, and at 11.30 the sun tempted the butterflies out of hiding. No sign of the ab., though plenty of others were flitting round. After an hour I decided to go back half-a-mile to where I had left my sandwiches, return, and eat them beside a favoured bramble bush. As I was just about to leave the area, a familiar sound in the sky and a flying bomb appeared, with a 'plane on its tail, firing. Nothing happened with the first few bursts, then a long continuous one and the robot engine ceased. I thought it time to go to earth. No trees were nearby, save a small one. This would have to do, as time was short, so I lay on my tummy beside it. I heard the air whistle as the bomb went over me. It hit the ground on the far side of the field beyond, and exploded. The blast lifted me up, and 'plump' I came down. A moment later a second flying-bomb came over, but this blew off farther away. "I don't know", I said to myself, "this puts new energy into me; I'll see whether that displacement of air has made my friend show herself". To my amazement, a few paces away there she was, on a bramble; and I'd searched the thicket from end to end, all the morning. This time I got the net well over, lowered and up she went. I was still holding the top of the net in my hand, where she was, when a third 'doodle' appeared, with a third burst of firing from the 'plane. Still holding her, I scrambled down flat where I was, but that again exploded some way away. My 'doodle-bug' was in a pill-box undamaged and in good condition. I went home satisfied.

By the Rev. J. N. Marcon,
and contributed by
S. G. Castle Russell (119).

ALL IN A LIFETIME

With a long winter behind you, and the first trip of the season planned for a week hence, there is always a great feeling of elation, and acts of feverish preparation, so that when the day arrives, the sun is shining brightly, you have collected your companion and set off, the world is entirely yours and all that is in your minds is the end of the two-hour car trip with the various species familiar to them flying up and down their haunts.

At a time like this we couldn't possibly worry about having a breakfast, so that, very shortly, we wished that we had partaken of some, and with memories of previous times when the collecting had been somewhat curtailed by a pang of hunger, it was decided to make a short stop. Choosing a likely spot, sandwiches were "dug up" and with nets in hand we commenced walking around in case anything should be missed.

Off we go again: the object of our trip heaves in sight; we are feeling fine. Suddenly the sun goes in. Our mouths fall open and our hearts drop an inch or two. Slowly, very slowly, we both turn round towards the direction from which the sun had been shining and behold an unbroken belt of cloud

We know it's hopeless, but proceed unconsciously towards the hunting ground. Perhaps we might find one specimen resting and it might be a var. On arrival, it starts to rain: a drizzle at first, then it gets heavier and the wind comes up. We huddle under some suitable cover, hopefully waiting for a break.

A Willow Warbler turns up about three feet above our heads, and, as if it had suddenly seen us, bursts into full song—an imitation of a hearty laugh starting on a high note and running down the scale and ending in a renewed guffaw. The first smiles appear, the Willow Warbler plucks a fat juicy green caterpillar from under our very noses and flies off with it.

Things were, after all, not quite so bad, so the next half hour was spent recording bird song. Most of the migrants had arrived and were singing. They didn't seem to mind the rain, but our own residents were nearly all feeling as we were. An occasional burst from a Blackbird, the more continuous song from a Missel Thrush, singing possibly quite close to its nest, and the distant drumming from a Lesser Spotted Woodpecker being the only representatives.

After a period of gazing around, a black booted leg was observed sticking out from under a bush. Our apprehension turned to relief when it was seen to twitch, so tossing up who should face the elements, it fell to my lot to investigate. On coming into view of the owner I beheld another collector whose face was one of utter dejection. He was coatless, his soggy net was draped over his head. and his satchel was opened to be as waterproof as possible and covering what it could of his person. After quick introductions and persuading him that our bush let in less drips than his, he condescended to join us and we were very soon "pals for life".

By late afternoon it was still raining hard, and feeling somewhat damp, we, still reluctantly, took our departure. Nearing home the sun popped out and on arrival home we were met with the words—"Have you had a good time?—it's been glorious here all day!"

There are many disappointments and discouragements in an entomologist's life: your breeding fails through disease or other mishap, or perhaps you have spoilt your best specimen whilst setting it. Don't let it discourage you. Keep trying and you will find that success, whatever it may be, will be far more appreciated in the end.

Some years back, a group of entomologists in this area of Lymington in Hampshire who were all members of the AES, and all out on a trip together, "came up against it". They were almost giving up, and were trying to decide the best thing to do when one member, having his only possible trip out that year, and not wishing to be disappointed, came out with a determined "Press on regardless!" They did: an hour later the sun was shining! "Press on regardless" has since been a byeword with them, and although limited in its sense has frequently served them in good stead—even if only for a good laugh!

Older collectors can recall the thrill which is experienced when a trip has especially been made for a species they have never captured before and the joy of beholding and capturing the first one on their arrival there.

I remember my first trip with a friend to see the Glanville Fritillary

flying. It meant a trip to the Isle of Wight. We, of course, had to head for the wrong area. A couple of hours proved fruitless, although we were well compensated with the amount of other species which were to be found. Suddenly my friend gave a shout: as luck would have it—there was one solitary "Glanville" sunning itself! What a thrill the sight of it gave us! We both made a mad rush at it. The next thing I knew was my friend's eyes popping out of his head and taking the Fritillary, considerably damaged, out of his mouth! Whether it flew in or whether I knocked it in

with my net in that mad mêlée we'll never know. All we did know was that the specimen was not worth keeping for the cabinet, and was released. If we had crept quietly up to it we might possibly have succeeded in obtaining a good specimen.

That is a rule to remember in almost every case. Always stalk your quarry, making no sudden or jerky movements whilst doing so, beginning your sweep slowly at the start. Then by the time the movement has increased and the insect has sensed it and flies you will be in a position to capture it with ease. And, please, never kill a specimen unless it is really necessary, and you want it to complete a series in your collection. Even then, having captured the specimen, examine it and release it if it is slightly rubbed. You will feel far happier if you have a really good specimen and have not destroyed others to get it.

Another disappointment which most collectors experience at some time is when their net has been torn on a bramble, and later something they really wanted has been captured—and escaped through the hole made earlier. Therefore it is always beneficial to carry a needle, already threaded to save valuable collecting time, and repair the net on the spot.

Another handy method, and quicker still, is to carry a small tube of solution taken from a puncture repair outfit, and join the ends with that, making sure you have something between the tear and the other side of the net to prevent sticking the net up completely. This is not a permanent repair but seems to save the situation until the return home, when lasting repairs can be made in the usual manner.

All these trials and many others befall a collector during his or her lifetime. There are sure to be disappointments, but patience and perseverance will overcome all these.

Ian G. Farwell (1445).

APPARATUS AND A TECHNIQUE FOR MAKING MOUNTS OF SMALL SPECIMENS

Whilst reading the section on genitalia preparations in the " Coleopterist's Handbook " (which, I am sure members will agree, has emerged in fine form after its prolonged and troublesome development), it occurred to me that certain methods and apparatus that I use might be of interest to members.

Forceps. Jewellers' or watchmakers' forceps are much finer and far more suitable for dissection than the " fine pointed forceps " sold by zoological dealers. They can be obtained from wholesalers in the Hatton Garden area of London, or probably through the good offices of a local shop. The coarser type (which is still finer than the " fine pointed " ones mentioned above) costs about 8/-, whilst the finest sort is about 16/-.

Needles. Stainless steel micropins, as sold by entomological dealers, if mounted in match sticks provide cheap and very thin needles; various sizes can be used and it is particularly useful to have some hooked at the end; sooner or later this usually happens by accident!

Macerating and clearing. Soften and clear in caustic potash in the normal way; when sufficiently clear, transfer for 1-3 minutes to glacial acetic acid which neutralises the caustic and partly dehydrates. From glacial acetic, the specimen is removed to creosote (Beechwood B.P.), which completes the clearing in a few minutes varying to half an hour for

a large object, e.g. genitalia of a *Carabus*. It can then be mounted directly in balsam. This method, a variant of which has been described by Leston (1953, *Entomologist*, **86**: 254), has the advantages that only three transfers need be made and no alcohol is required. The former is an important factor with a very small object, whilst it is often either difficult, or expensive, for the amateur to obtain alcohol. It is best to dissect out claspers and other structures from large specimens in the caustic potash, but with small objects this can be delayed until the creosote or the mountant itself is reached. I should perhaps stress that it is creosote B.P., as found in some cough mixtures, rather than the " decorating " variety, that is used!

Both the forceps and the needles mentioned above are very useful in the normal carding of whole beetles and though the former may seem expensive they are well worth the cost, as they make work on very small insects twice as easy. No originality is claimed for any of the above methods.

T. R. E. Southwood (1051).

FLUID EMISSION BY LARVAE

The observation made by Mr. Pringle (*Bull. amat. Ent. Soc.*, **13**: 58-59) of a larva of *Deilephila elpenor* (Linn.) emitting a drop of green fluid from its mouth, when irritated, is surely not such an infrequent happening in lepidopterous larvae. I am sure it will have been noticed by many that the habit is fairly widespread in the Order, and in particular may I cite two very common species, *Pieris brassicae* (Linn.) and *Aglais urticae* (Linn.), which produce a dark-green fluid most readily when handled.

I have witnessed in the case of a larva exuding a drop which remains on its head and fails to make contact with any surface that the larva will re-absorb the liquid after provocation has ceased.

The fluid is not always green; in some species it is brown, e.g. *Hepialus humuli* (Linn.), nor is it confined to the Lepidoptera, as it is also exhibited in larvae of some ground beetles (Carabidae) and in the larvae of many other insects, no doubt.

J. A. Hardman (1234).

HOW WAS IT DONE?

In reply to the above question (*Bull. amat. Ent. Soc.*, **13**: 21) I should like to point out that Man, an animal which relies principally on sight, with touch and hearing coming about equal as very subsidiary seconds, can detect the smell of his own ejectamenta and external secretions (especially when these are not as fresh as they might be!) from some *yards* off. Bearing in mind that Man's chemical senses (taste and smell) are becoming obsolete and therefore very poorly developed by comparison with those of animals which rely mainly upon them, what *I* find so remarkable is that Man (and " biological Man " at that) is still surprised at the relative acuity of the chemical senses of, say, Insects, though he knows very well that Insects rely mainly on these senses, with touch a close runner-up.

It seems to me that, to the caterpillar in the story, its old skin probably stood out " in aromas of fire," so that all it had to do to reach the skin was to move in the direction in which the smell got stronger, which would be the course it took.

If you don't like this explanation, it might well be that, on finding itself with an unsatisfied appetite for " old skin," but in a situation with no old skin but plenty of other food, it reverted to the behaviour of all plant-feeding caterpillars faced with a distasteful food, and marched down the plant, i.e., in the direction of the ground, to which nearly all plants are attached, and from which nearly all others spring. On reaching the bottom one of two things is likely: either the position of the butt-end of the fresh stem coincided (by chance) with that occupied by the old piece from which the caterpillar had walked to moult, so that it merely picked up its own trail of silk rungs or smell; or the skin was reaching that stage of dryness when the last (i.e. least volatile and heaviest) " smells " were evaporating from it. Being heaviest, these would probably sink vertically down the side of the container to the caterpillar, which would then walk up the diffusion gradient.

Whichever way it happened, Bob's your uncle! And so to bed.

Peter G. Taylor (719).

CŒNONYMPHA TULLIA MUELL. IN MALTA?

I was surprised to see in *Bull. amat. Ent. Soc.* **13**: 12, the name of *C. tullia* Muell. = *tiphon* Rott, included with the names of some butterflies taken from Malta by my friend, Mr. D. H. Heppell (1690).

Our island is not within the range of distribution of this butterfly; in fact, it is not found in Southern Europe, nor in the islands of the Mediterranean, nor on the coast of Africa.

I saw the four specimens taken by my friend; they are *Coenonympha pamphilus* exerge *lyllus* Esp., a second brood of *pamphilus*. It has been recorded since 1891 by Count Caruana Gatto, in 1904-5 by T. B. Fletcher, and again by Adolf Andres in 1916.

Two years ago I sent several specimens of this butterfly to Dr. Ruggero Verity of Caldine, Italy, and he confirmed its name as such, and included it in his recent publication.

For those who are interested in the butterflies of our island may I add the following species which are not mentioned by Mr. Heppell, and which are found quite commonly:—*Pararge megera* Linn., *Maniola jurtina hispulla* Hbn., *Tarucus telicanus* Lang, *Lampides boeticus* Linn., *Aricia agestis* Schiff., *Gegenes pumilio* Hoffm., *Gonepteryx cleopatra* Linn., and three very rare ones, viz., *Polygonia egea* Cram., *Danaus chrysippus* var. *alcippus* Cram., and *Hipparchia algirica* Obth. n. ssp.

ANT. VALLETTA (1879).

REFERENCES.

Gatto, Count Caruana. (1891.) Notes on the Lepidoptera of Malta. *Mediterranean Naturalist* p. 85.

Gatto, Count Caruana. Prima contribuzione alla Fauna Lepidotterologica dell' Isola di Malta.

Fletcher, T. B. (1904-5.) A preliminary list of the Lepidoptera of Malta. *Entomologist* **37** : 273-276, 315-319; **38** : 18-20.

Andres, Adolf. (1916). Verzeichnis der wahrend meiner Kreigs-gefangenschaft von mir auf Malta gesammelten Lepidoptera, Hemiptera und Coleoptera, *Entomologische Rundschau* **33** Jahrgang No. 9 : 43-45; No. 10 : 48-49; No. 11 : 50.

Verity, Dr. Ruggero. Le Farfalle diurne d' Italia. Vol. 5.

BOOK REVIEW

The World of the Honeybee. By Colin G. Butler, M.A., Ph.D. Pp. 223. 2 colour and 87 black and white photographs taken by the author. Collins, London. 1954. New Naturalist Series. Price 21/-.

This excellent book, No. 29 in the New Naturalist Series, is well up to the standard of the previous volumes, and is the culmination of many years of research by the author, Dr. Colin Butler, who is now head of the Bee Department of the Rothamsted Experimental Station at Harpenden.

Although so many books have been written about bees, most deal with the subject from the beekeeper's point of view. Whereas many beekeepers are entomologists, there are entomologists interested in bees who are not beekeepers, and it is particularly to the latter group that this work will appeal.

The book relates all the known aspects of the natural history of the honeybee; origin, evolution, world distribution, behaviour, reproduction, swarming, food, etc. Perhaps the most interesting section of the book is that dealing with the colony's recognition of the queen by means of 'queen substance' recently discovered by Dr. Butler. Briefly. it seems that the bees nearest to a queen of a colony acquire her odour, or possibly some substance, which she either gives them as food, or which they obtain themselves by licking her body. Whatever this substance may be, those which acquire it pass some of it on, either deliberately or accidentally, to other bees who in their turn pass it on to others still. In this way every worker in a colony is satisfied that her queen is present as long as she obtains some of this 'queen substance' from the queen or via other worker bees.

The illustrations are of high quality, depicting the many incidents in hive life, and are produced at an average scale of three diameters. Colour photography is not such a feature of this book, as in most of the series, but the subject does not really call for colour reproductions.

A short bibliography and an adequate index complete a work that one would not hesitate to recommend to naturalist and beekeeper alike. R. S.

Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. 1954.

AES NOTICE

WHERE TO WRITE

Membership applications, offers of help to: D. OLLEVANT, *3 Salcombe Drive, Morden, Surrey.*

Advertisers to: L. W. SIGGS, *10 Repton Road, Orpington, Kent.*

Changes of address and non-arrival of Bulletins *to:* B. L. J. BYERLEY, *48 Elmgrove Road, Harrow, Middlesex.*

Offers to lead Field Meetings, exhibit, etc., to: K. H. BOBE, *19 Hengist Road, London, S.E.12.*

Manuscripts, drawings and books for review to: B. R. STALLWOOD, *19 Southfield Gardens, Strawberry Hill, Twickenham, Middx.*

Subscriptions (12/- per annum, 6/- for Juniors) to: R. W. WATSON, *15 Halstead Road, Bitterne, Southampton.*

Youth matters to: S. M. HANSON, *167 Gunnersbury Park, London, W.5.*

BACK NUMBERS

OF THE

AES BULLETIN

1s. 3d. a copy

are available from:—

B. L. J. BYERLEY,
48 Elmgrove Road,
HARROW, Middlesex

Complete volumes with covers and index

Volume 7,	1946-8	232 pp.	**21s.**
Volume 8,	1949	96 pp.	**10s. 6d.**
Volume 9,	1950	108 pp.	**10s. 6d.**
Volume 10,	1951	124 pp.	**10s. 6d.**
Volume 11,	1952	116 pp.	**12s. 6d.**
Volume 12,	1953	96 pp.	**12s. 6d.**

From

A E S, 1 WEST HAM LANE, LONDON, E.15

MEMBERS!

Have you prepared your Exhibit for the ANNUAL EXHIBITION?

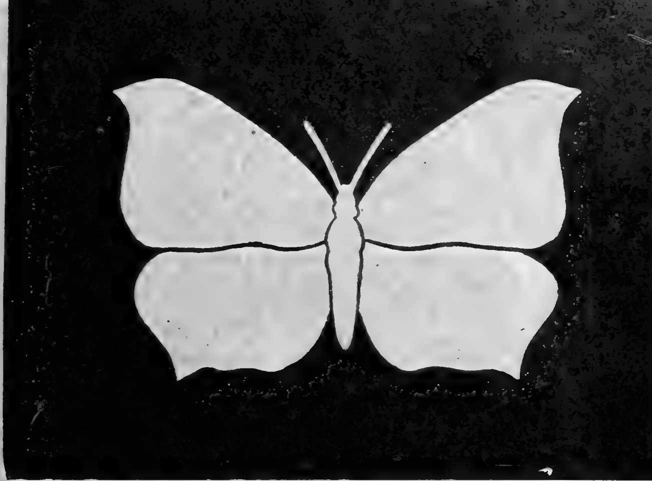
To be held in LONDON in SEPTEMBER

Full Details Next Month

VOL. 13

No. 165

EMBER - 1954



THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

EDITED by B. R. STALLWOOD

AES BULLETIN

No. 165

SEPTEMBER 1954

LEPIDOPTERA IN THE MIDDLE EAST

I am a very humble beginner but, having recently been granted the privilege of becoming a member of the AES, I thought it might perhaps be of some small interest to record how this came about.

I had an interest in entomology at an early age and made a collection of Lepidoptera at school. But then followed many years, including the war years, when I lost interest or lacked the opportunity. My interest was re-awakened in 1949 when I was stationed in Hong Kong. However, I lacked any equipment and, before I could provide myself with any, the Korean war intervened. It was not until 1953 that I took up again the hobby which I had discontinued some twenty years before.

I was now stationed in the Canal Zone, serving with the 16th Independent Parachute Brigade, and like most people there I was very soon seeking an escape from the tedious restrictions of the Zone. It was April and already warm; I was too late for the duck shooting and too early for the fishing. One day, in the small Mess garden, consisting mainly of flowering shrubs, I found a large and beautiful green moth. Obviously, from its perfect state, it was newly emerged from the pupa, and was easily identified as a hawk moth. A faint memory from nearly twenty years ago connected it with the Oleander bushes in the Mess Garden.

I then began to wonder whether there might not be other species to be found here. I was surprised to discover after a few days of searching that this hot, mostly barren, stretch of sand alongside the canal did, indeed, hold a number of different species, and I was soon engaged in collecting and identifying them.

Last summer and autumn I collected the following species:—Death's Head, Oleander, Convolvulus, Striped, Silver Striped, Humming Bird Hawk Moths; and Painted Lady, Red Admiral, Milkweed*, Clouded Yellow (two varieties), Long Tailed Blue and Skipper butterflies. All of these came from the Ismailia area of the Canal Zone. In addition, I found an Oleander in the Wadi Gharandal in Sinai, a most unlikely place. It is a narrow jagged cleft in the Southern mountains of the peninsula, up which the armies of Mahomet and a French Cavalry Squadron from Napoleon's Egyptian expedition had some time travelled before us. A little later a Striped Hawk Moth flew into my tent during a battlefield tour of the famous Knightsbridge Box, South of Tobruk. This one came home in a tumbler inverted in a sock for want of a killing bottle!

The list I have given above is only the beginning I am sure; but even if it were the limit of the species to be found here I would be satisfied, for one might well expect the desert tracts of the Middle East to be almost devoid of Lepidoptera. Further, I have regained touch with an interest and hobby which I hope now to continue in more fruitful lands than the one in which I am stationed at present.

H. H. M. MARSTON (2342).

*[The Milkweed butterfly *Danaus plexippus* Linn. is an American species. I think Major Marston is possibly confusing it with the African Danaid, *Danaus chrysippus* Linn.—ED.]

WAINSCOTING IN NORTHAMPTONSHIRE

What is your idea of spending a pleasant Sunday morning? What about wading knee-deep in mud, while with a sharp penknife you slit the tough stems of reeds upwards for six inches or so, trying desperately the while to keep your balance on the river-bed, which more often than not is slimy, covered with weeds, and slopes downwards at an angle.

Or perhaps you would rather lie flat on your stomach on the bank, your upper half hanging over the edge, and hoping with a kind of resigned endurance that you will not fall in—at least, not until you have found one or other of the more uncommon British Wainscots, none of which can really be said to be easy to obtain in any of its stages, except perhaps one or two

which are not uncommon in their own favoured localities.

Northamptonshire is certainly one of the best counties for these elusive creatures. In my twenty years or so of collecting British butterflies and moths, I have found all but the three rarest species of the Wainscot group in the Nene reeds and sedges. I can also boast—so far at any rate—that I have never yet fallen in trying to obtain them, but perhaps that is still to come. It is as well, perhaps, to be a good swimmer before setting out on one of these expeditions. Fortunately the species of reed which are commonest, namely, the common reed (*Phragmites*) bulrush (or reed-mace) and jointed rush, are the favourite food-plants of most of the wainscots—at least the ones which are likely to come your way. However, you should not neglect yellow flag iris, bur-reed (*Sparganium*) and various sedges.

Most of these moths are quite sombre to look at; they have none of the gaudy hues of the "tigers", nor are they large in size, like the hawks. Nevertheless, as any Wainscot-enthusiast will tell you, they have a fascination all their own. Many of them are so similar in appearance that the uninitiated may easily mistake one species for another; but this only serves to intensify the excitement of the hunt, as even the experienced entomologist cannot always be certain which one he has found, without checking with his reference books.

The would-be Wainscot-hunter must be prepared for disappointment. There is none of the easy accessibility of butterflies on the wing, which can be caught by a deft stroke of the net; most Wainscots fly among reeds, and to catch them by the orthodox method one would require both hands for rowing or swimming, and the only way left to wield the net would be by holding it between one's teeth. The usual way to obtain any of the moths of this group is to look for them in their larval or pupal stages.

A tiny hole in a reed-stem is usually the only sign that the stem is inhabited, and even this is not always clearly visible. Very often the stems are last year's, and the hole is that from which the moth has already escaped several months ago. Not always are the old stems tough and woody, and they can often be mistaken for this years's growth; while, conversely, it is a frequent occurrence to discover that what would appear to be old stems are, in fact, the new season's off-shoots, and contain—sometimes—a coveted prize. Instinct and intuition are about as good as anything to go by when engaged in this task, which can sometimes prove to be as difficult as the proverbial looking for a needle in a haystack.

An important point, which should not be overlooked, is that the stems should be slit both above and below the hole, as some species pupate, head downwards, above the exit hole, while others prefer to remain below it, head pointing in the direction from which the moth will eventually make its escape.

The Common Wainscot (*Leucania pallens* Linn.), though the commonest of the group, has actually come my way less often than others which, in general are less frequently met with, such as the Concolorous (*Arenostola extrema* Hb.), the Fen Wainscot (*Arenostola phragmitidis* Hb.) and the Brown-veined Wainscot (*Nonagria dissoluta* Treit.), all of which are considered to be somewhat scarce and local species.

The Bulrush Wainscot (*Nonagria typhae* Thunb.) is the exception that proves the rule, as the pupa of this particular species should be looked for in the previous year's stems. As its name implies, this species prefers the plant in which legend has it that the infant Moses in his basket was hidden. The male of this species, like most others of the group, responds freely to the attractions of light, and if you are not so keen as I am in paddling with a penknife looking for the pupæ, you may, perhaps, find it more exciting—and profitable—to ensnare the imago by this means during the autumn months.

The procedure is simple. You need a strong light, preferably an acetylene lamp, a white sheet, and a few glass- or celluloid-bottomed boxes. There is little point in stuffing all your available pockets with dozens of boxes, as wainscots are not ten a penny, not even the so-called Common Wainscot. Neither do you need a net, for reasons which I will presently explain.

Having arrived at your "pitch"—a reedy riverside—you spread out the sheet on the bank as near the reeds as possible and stand your lighted lamp in the middle. If there are any wainscots about they will soon flutter from the reed-beds to the lamp, settling on the sheet in the reflected glare, and you can box them at your leisure, with all the expectancy of wondering whether you have got, perhaps, Webb's Wainscot (*Nonagria sparganii* Esp.), or the Large Wain-

scot (*Rhizedra lutosa* Hb.), which are extremely similar; or one of three others which are hardly distinguishable without close study, the Reed Wainscot (*Nonagria cannae* Ochs.), the Lyme Grass (*Arenostola elymi* Treit.), or the Smoky Wainscot (*Leucania impura* Hb.). As far as the last three are concerned, it will most probably turn out to be the last-named; if you should find it to be the Reed Wainscot you can count yourself lucky, and in the unlikely event of its being the Lyme Grass, you will certainly have cause for rejoicing. My first Lyme Grass has yet to grace my collection, after twenty years!

If you trap your Wainscots by playing upon their weakness for bright lights, you may attract not only Wainscots but also the police. As I said, you may find the light method more exciting than pupa-hunting, especially if local rustics suspect you of being a secret agent or a loiterer with intent to trespass, as has happened to me more than once.

I shall never forget the look on the face of the local constable on one occasion when he drew alongside on an ancient bicycle, with truncheon at the ready, and found that the suspect in zip jacket and old corduroys had not made a hasty departure, leaving a body in the bulrushes, but was, after all, only a "craazy wooman lookin' for boogs, begad!"

JOY O. I. SPOCZYNSKA (751).

PRACTICAL HINTS — September

Summer, what we have seen of it this year is almost over; yet there remains much for the lepidopterist to do before his net is laid down for the season. Those with time and inclination might like to dash off to Kent and search the Yellow Toadflax growing on the shingle at Dungeness for larvae of the noctuid *Calophasia lunula* Hufn. (Toadflax Brocade). Others will plaster 'sugar' on likely posts and tree trunks in the hope of capturing one of the scarcer noctuids. Whatever your methods, the sport will no doubt be good—weather permitting!

Larvae collecting can be most interesting. Most of those found will be fully fed and will present little trouble in the conversion to the moth. Keep an eye on chestnut trees for larvae of *Apatele aceris* Linn. (Sycamore) which may often be found descending the trunk on their way to a suitable pupating site.

Ova stored for the winter months are best kept in chip boxes in a cool outhouse. For those who are forced to keep everything indoors I suggest trials with glass-topped tins. Most breeders will frown at the idea, but some years ago when I just had to keep things indoors, I tried both methods and found that tins gave me 100% against under 50% with chip boxes. My theory is that the egg shells became too dry for the larvae to escape, or the whole egg lost too much water by evaporation.

The ivy should be in flower at the end of the month and will attract many autumnal species, including *Conistra ligula* Esp. (Dark Chestnut), *Conistra vaccinii* Linn. (Chestnut), *Agrochola circellaris* Hufn. (Brick), *Meganephria oxyacanthae* Linn. (Green Brindled Crescent). Hibernating larvae should be housed in well ventilated cages stored in a cool yet airy outhouse. Frequent inspections should be made to see that all is well.

The larvae of *Colocasia coryli* Linn. (Nut-tree Tussock) may be beaten from Beech and Oak during September. By searching Ragwort, Mugwort or Yarrow by torchlight after dark, the larvae of *Eupithecia succenturiata* Linn. (Bordered Pug) can usually be found in plenty. Though more frequent in coastal areas this species occurs in many inland localities. The larva of *Drepana falcataria* Linn. (Pebble Hooktip) is to be found commonly in September on Birch. Also on Alder where this tree is common. *Drepana lacertinaria* Linn. (Scalloped Hook Tip) is also common on Birch; usually found sitting on the upper surface of a leaf. The flowering heads of grasses, particularly in woodland rides or on borders of woods, are worth searching soon after dark for the autumnal species. *Cirrhia fulvago* Linn. (Sallow), *Tiliacea aurago* Schiff. (Barred Sallow), and *Citria lutea* Ström. (Pink Barred Sallow) have been taken more frequently by this means than any other (except beating for larva, of course). Imagines of *Griposia aprilina* Linn. (Merveille-du-Jour) can be found at rest on the trunks of oak. This species is best taken in the pupal state in late August or first few days of September.

When breeding *Hemistola immaculata* Thunb. (Small Emerald) which feeds on *Clematis vitalba* (Old Man's Beard, or Traveller's Joy), the larvae hibernate as soon as the leaves start

to fall, and will take up their winter quarters in the feathery seedheads of the plant. A well ventilated cage well stocked with these seedheads, which should be collected when dry, will house your larvae safely through the winter if kept indoors in a cool situation. This species winters much better indoors than out.

Larvae of *Parasemia plantaginis* Linn. (Wood Tiger) will feed up and produce moths in October or November, if kept in a warm corner of the kitchen. *Arctia caja* Linn. (Garden Tiger) will sometimes do this, though it frequently happens that only part of the brood respond to the treatment. Those which do not continue feeding should be removed to cooler quarters immediately, otherwise they tend to die off through drying up.

R. V. Aldridge (262).

ORXINES MACKLOTTI de Haan (ORTH. PHASMIDAE)

After having read the very interesting article on *Orxines macklotti* (the Javanese Stick Insect), *Bull. amat. Ent. Soc.*, **12**, 62, those members interested in Phasmidae will understand that I wanted to obtain living specimens of that species as soon as I could. I was fortunate enough to obtain a dozen specimens, and was at once struck by their strange behaviour, compared to that of *Carausius morosus* Br. v. W. (Common Stick Insect). Each time they are disturbed, the insects walk slowly round their cage, swaying their bodies from the ankle of each leg, in something of the manner of *morosus*, but with a much more accentuated movement due to the great length of leg.

At first the general colour was a very attractive mottling of pinkish-buff and browns of various shades. There is no change in the insects until about a month before they mature. At this stage, tiny wing buds appear, these increase in size with each moult, until at the last instar, they are fully developed, but not yet mature. It is not until approximately a week has elapsed, and the Stick Insect is able to raise its wings, that it is able to pair and oviposit. The pairing takes place about a fortnight after full maturity is reached. It would be quite easy to miss seeing a pairing, as it is quite brief, lasting only about an hour, takes place at night and could be described as a still photograph of a wrestling match! To date, I have seen one pairing, but probably more insects have done so unobserved.

Now a word about the peculiarities of this attractive species. The greatest difference between the Javanese and the Common Stick Insect is, that *macklotti* is winged. These wings, although useless as such, are very striking, for when an insect is disturbed, it raises its wings, and shows a flash of the vivid scarlet with which they are coloured. The wings are approximately the same size as the underwings of *Catocala nupta* Linn. (Red Underwing) and about the same colour, with a single black band, which has running down its middle a line of white spots. The probable use of the wings is to alarm any would-be enemy. Another remarkable thing is the capability of this species to produce a very strong, but most pleasant scent, which cannot be described as anything but smelling of Javanese Stick Insect. The scent is very strong, so strong, in fact, that if a deep breath be taken near the specimens in question, the odour will make one cough. The scent is presumably some defensive fluid, and certainly has an adverse effect on my dog, who sneezes for some while after being in the area of the creature. The fluid is only ejected when the insects are very much disturbed, and is highly volatile, lasting only a minute or so. Both males and females are capable of producing the odour which appears to be quite unusual in the order Orthoptera, although several species (e.g., cockroaches) are capable of producing smell, but in every case, it is an unpleasant one.

The colouring of the adult is also strikingly different in each sex. The male is green in the abdomen, yellow in the area of the thorax with green legs; the female, on the other hand, is uniform in colour, retaining the pinkish brown and dark brown of the immature insect. This, however, is made up for by the colour of the wings. The average length of the male is about 2 ins. and of the female 3-4 ins.

Orxines macklotti feeds on Rhododendron, and although it does not strip the foliage as is the case with some larvae of Lepidoptera, it certainly eats more than *morosus*, and is quite as easy to rear, although it is very susceptible to cold. I had an alarming experience with my insects, as the heating in my breeding cages failed, due to an electricity cut, and

after a severe frost I found all the *macklotti* prostrate on the floor of the cage. However, the apparently dead insects were placed on warmed sheets of paper, and soon revived, but if prompt and careful 'first aid' had not been applied, I might have lost the entire stock.

R. C. CHANDLESS (2213).*

LETTERS TO THE EDITOR

THE PUSS MOTH (*CERURA VINULA* LINN.)

L. S. BEAUFOX (628) writes:—Last May, my wife and I were looking for ova of this moth on some low pollarded poplars. We soon found a couple, and it was not until my wife said "I thought you told me to look on poplar leaves" that I realised they were not on poplar but on ivy. The ivy leaf was very near to some poplar leaves, but the young larvae would have had a long crawl to get to them.

Incidentally one of the eggs had the palest colouring I have ever seen in *vinula*—a very light biscuit brown. Both have since hatched and are progressing normally on poplar. I did not try ivy as a pabulum as I had not enough of them for experiments.

THE PEARL-BORDERED FRITILLARY (*ARGYNNIS EUPHROSYNE* LINN.)

From BRIAN WALLIS (1832):—This year I bred two specimens of *euphrosyne* which pupated on 10th May and emerged within minutes of each other on 4th June. Having gathered from both Frohawk and Sandars, that the pupal stage lasts only nine days, I was surprised that these two should take 25 days to emerge. I should be interested to know what other members have found the usual period to be.

[The unusually bad summer weather seems to have upset the usual time of emergence of most butterflies this year, although the Pearl-bordered Fritillary was flying in numbers in Surrey on 13th May. On the other hand the Meadow Brown (*Maniola jurtina* Linn.), usually out by 10th June, did not appear until 2nd July.—ED.]

"HAND-FED" BUTTERFLIES

E. WARTERSON (2303) writes: I have been feeding the White Butterflies, *P. brassicae* Linn., and *P. rapae* Linn. on a sugar solution and have noticed how they readily take to it when I put it on to the zinc gauze which forms the ends of the cage.

To-day, however, after having applied the solution to the gauze, I lifted one of the *P. rapae* on to my hand, and it started to move towards the drops left upon my fingers, lowered its proboscis, and started to draw it up. After a few minutes I placed some on my other fingers and put this hand beside the other, and the butterfly eventually moved across, and sampled the solution on most fingers.

Eventually, after five minutes I placed it back in the cage, without its trying to fly away.

I should like to hear if anyone else has had similar experience with "hand-fed" butterflies.

FURTHER OBSERVATIONS OF THE LARVAE *ARCTIA CAJA* LINN. (Garden Tiger)

I should very much like to add the following observations from my limited experience to the notes of Mr. G. S. E. Cross (1453) in *Bull. amat. Ent. Soc.*, **13**: 61.

Late last year I found four of these larvae on a sallow tree. Three of these were on the main stem, and, as at the base of the tree was a growth of nettles, I thought they may have come from here, but unlike Mr. Cross my search was unfruitful.

However, looking around I saw a patch of dock about 10 yards away, and on searching these found 6 more larvae. I cannot say if the first larvae came from this patch, and as at the time I did not search among the nettle roots (under ground level) I cannot be sure that they were not from here, or on the other hand had been feeding on the sallow. I have not, however, yet found *caja* larvae hibernating on the ground, and this may be the answer to the larvae in the tree.

On May 26th, while going for my lunch, I passed a car-park on a 'blitzed' site, about two minutes' walk from the main shopping centre of Manchester. The day was very hot and I was walking slowly. I noticed a single larva moving at great speed into the roadway where its life was nearly ended by a passer-by. Being soft hearted (except where imagines are concerned) I picked it up and looked round for the foodplant. I soon found this. It was a patch of dock about 7 yards by 3 yards in area. As I approached it I saw that

in one area the ground was literally covered by nearly full-fed *caja* larvae.

Forgetting lunch, I began to search the dock leaves. The first thing I discovered was that most of the larvae were confined to an area of about 6 square yards. However, I went over the rest of the area until in one corner I came across an apple tree.

By this time my activities had been seen by the attendant, who came over to investigate. When I had convinced him that I was not doing any damage we began talking. I learned that the *caja* larvae had been making themselves unpopular by getting into cars and in his own words by " eating the perishin' tree." I then took a closer look at the tree, and, sure enough, the leaves had been eaten and, furthermore, I found a cast skin, but did not find any live specimens.

I am inclined to agree with Mr. Cross, that the tree had been used for their hibernation and not as a food-plant, but I disagree with him when he says that *Arctia caja* is not gregarious. I should like to say that it is. Off this site and from the 6 square yards mentioned above I took 78 larvae in just over five minutes, and I know from my previous explorations that there were only a few more in the rest of the herbage.

In my cages these larvae are eating 15 large-size leaves daily; and to add to my statement that *caja* is gregarious, I should like to say that another patch of dock only a few yards away had been stripped. In my view, this points to the fact that the larvae had moved from one patch to another in a complete batch, instead of going separate ways.

I thank both Mr. Benson and Mr. Cross for their notes, and I hope that the above may help to clear up a few points on this very variable moth.

B. Lomas* (1984).

•

THE LITTLEWOOD PUPA-CAGE

2

Now to make the pupa-holders or artificial cocoons. This, I warn you, is a tedious job—at first; in fact collectors of the slap-dash variety would probably regard it as a silly finicking business not worth the time and trouble. They would be wrong. Once made, the pupa-holders appear to be everlasting, and of their efficacy there can be no doubt at all. You can think out for yourself the advantages of retaining humidity in the air immediately surrounding a pupa (the pupa-holders are tubes closed at one end, constructed of a material that absorbs, and retains, moisture), not to mention the immunity of your pupae from meconium shed by a number of emerging moths. The pupa-holders are in fact the essence, the head and front, the keystone, of the Littlewood Pupa-Cage.

The materials required are several yards of webbing or 'binding', 1 inch, $1\frac{1}{4}$ inch, and $1\frac{1}{2}$ inch wide. It is the kind of thing that is sewn to the top hem of curtains and casement cloths, to which the rings or hooks are sewn or pinned. It must be quite soft, and not 'sized'. You must also procure a roll of brown gummed strip-paper such as one uses for doing up small parcels, the same widths as your webbing. The only other things required are pencils and similar pieces of cylindrical wood of various thicknesses. Then proceed like this:—

Cut off a piece of webbing an inch long and a piece of gummed paper $1\frac{1}{4}$ inch long. Fold back $\frac{1}{4}$ inch on one end of the gummed paper, lick the rest, and apply the webbing to it, neatly. Then roll this round a pencil. Lick the $\frac{1}{4}$ inch overlap (piece which you have folded back) just as you would if you were rolling a cigarette, and so complete the artificial cocoon. By cutting up a number of required lengths of webbing and gummed paper before you begin operations you ought to be able to make 40 pupa-holders in an hour easily.

That is all there is to it. You can modify or adapt the process to your liking—the method I have described is the one that I personally devised and I find it the most expeditious. For various reasons the pupa-holders on each slat should be of uniform size.

The pupa-holders must be fixed to the slat by a spot, on the underside of each holder, of a spirit-adhesive or quick-drying varnish (*e.g.* shellac). Glue, gum and pastes mixed with water are useless, as the damp atmosphere in the cage prevents them from setting hard. Littlewood used to stretch a piece of one-inch tape right across the pupa-holders, from end to end of the slat, fastening it underneath the slat. This is undoubtedly an improvement, because when the moths emerge they clamber over the slats in front of them to reach the walls of the cage, and Littlewood's device gives them a secure foothold (the gummed paper is slippery) and mops up any meconium shed, so that

a fresh tape now and again keeps a row of pupa-holders from becoming covered with meconium and thereby unsightly if not insanitary. Moreover, should a pupa-holder come loose the tape will hold it in position.

In the case of substantial cocoons—and on no account should such cocoons ever be opened and the pupae extracted—lay the cocoons side by side on a slat devoid of pupa-holders, and stretch a tape right across them, from end to end of the slat as previously described. If necessary a spot of adhesive will hold the cocoons to the tape.

Remember that the pupa-holders must be a little larger than the pupae they contain, otherwise an emergent moth may not be able to push off the 'fused appendages' (part of the pupa-case covering wings, antennae and legs). An eggspoon is the best tool for tipping the pupae tail-first into the holders. Never touch a pupa with your fingers if you can possibly avoid doing so: the lightest pressure may injure the minute tracheoles and developing structures, and then your moth may be slightly imperfect. Some lepidopterists habitually pick up pupae with their fingers. It is shocking bad practice. The correct way to move a pupa is to push it, gently, with a camel-hair brush, into a spoon, and thus transport it whither you wish.

The inside walls of the cage must not be planed smooth: emergent moths must be able to climb them quickly and easily, so that they can attain the tray, from which they hang to expand their wings, as soon as possible. Littlewood 'papered' the walls of his cage with cream-coloured net and found it a success. He wrote me: "I can strongly recommend this addition. The net gives an excellent foothold, and looks clean and tidy". For my part I do not altogether like this modification. "Clean and tidy" the first year, yes; but in later years? Having a craze for hygienic conditions where the rearing of larvae and pupae is concerned, I like to be able to scrub out and sterilize my cages every year. One cannot scrub netting pasted on to the walls of a cage. However, this is a matter of opinion, and often what is one man's meat is another man's poison.

If the pupa-cage is kept out of doors or in an outhouse the round holes in the front and back walls can be left wide open for ventilation; or else you can close some or partly open some, according to the weather, that is to say whether it be hot or cold, wet or dry. Remember that *sudden* rises of the thermometer in wintertime are responsible for much mortality of pupae in the wild; therefore shut up the ventilation holes whenever the mercury of your thermometer rises high and quickly at the end of a period of frost. It is a wise plan to screw a small thermometer to one of the walls of your cage, inside, and to hang another one outside the cage. If the cage be kept in a room which has a fire in it, very little ventilation will be required, but keep a constant eye on the level of the water in the trough.

Practice makes perfect: the Littlewood Pupa-Cage is as nearly automatic as can be; but the wise breeder does not put it away on a shelf for weeks on end and hope for the best. During long-continued foggy weather open the lid of the cage wide for an hour in the middle of the day, or open it and fan out air that might become stagnant. Like everything else which one undertakes in this world, the greater the pains the greater the success. Experience is the best teacher, and failures (which make us think) teach us more than successes (which we take for granted).

Remember also that in this kind of pupa-cage the wings of newly emerged moths remain limp for longer than they do in a dry cage. So when large moths emerge it is wise to open the lid of the cage and keep it open for an hour or two. Never disturb a moth which is in process of expanding its wings; but as soon as an insect has assumed its normal resting attitude you can, if you like, remove it from the pupa-cage by inducing it to crawl into a cardboard box, where it can remain for an hour or so before being killed.

The above description of the Littlewood Pupa-Cage sets forth the dry bones only. You can, and I hope will, add various adaptations and embellishments to your liking, such as brass drop handles ('won' from an old piece of furniture) at the ends; small 'feet' to raise the cage off the shelf or table on which it rests; a short strut (screwed at one of its extremities) to keep the lid open a little or a lot; a brass chain to prevent the lid from falling back; and so on and so forth. But so long as the basic principles are adhered to you will, I am sure, never regret the time and labour spent on making a Littlewood Pupa-Cage.

P. B. M. Allan.

'OTHER ORDERS' ATTRACTED TO LIGHT: HEIGHT OF FLIGHT

The following extracts from letters from two members raise an interesting point.

P. J. M. Greenslade (2211*) writes:—"Surely you would consider the Common Cockchafer (*Melolontha melolontha* L.) a regular visitor. Here at school [Sherborne, Dorset] a large dormitory block faces some elms. Every week during the early part of the Summer Term one can be sure of one or two beetles flying round the lights. It is interesting to notice that the 'chafers appear only at the first floor windows, never at the ground floor or the second floor; this would indicate that the height of flight is from 15 to 25 feet, i.e., the height of the windows".

R. W. J. Uffen (1660) writes:—"Lacewings [Neuroptera, Chrysopidae] are much attracted to light. I have never examined those which occur here [Stamford Brook, London, W.] closely enough to know more than that there is at least one green species, and one brown species, both of which are attracted to light on the first floor".

Mr. Uffen's observation may or may not confirm that of Mr. Greenslade, since he does not say that lacewings are not also observed at light on the ground floor or (if present) the second floor. But Mr. Greenslade's observation, while not perhaps necessarily susceptible of the precise deduction which he makes, does nevertheless appear to indicate some definite preference in the matter of height, and it might be interesting to make some experiments, in a 3-4-storeyed house in a suitable locality, to check this. If there were 3-4 windows of approximately equal size in a vertical row, illuminated by lights of equal power, and these lights were switched on, *in turn,* for equal periods on a suitable night, or nights, it might be possible to draw some more reliable conclusions as to the average or preferred height of flight of the insects concerned. The accuracy of such conclusions would obviously be enhanced if some method could be devised of 'beaming' the light in a horizontal plane. Perhaps some members (lepidopterists or others) have already experimented—intentionally or not—along these lines.

I would like to take this opportunity of thanking these and other members (see *Bull. amat. Ent. Soc.* **13**, 65) who have kindly written in on this subject, first raised by me in *Bull.* **12**, 95.

H. K. Airy Shaw (545).

BOOK REVIEW

Handbooks for the Identification of British Insects. Vol. V, Part 9. Coleoptera, Lagriidae to Meloidae. By F. D. Buck. Pp. 30. Price 6/-. Vol I, Part 2. Thysanura and Diplura. By M. J. Delany. Pp. 8. Price 2/6. Royal Entomological Society of London. May, 1954.

Many entomologists, like the reviewer, have come to look forward with eager anticipation to the periodic issues of further Handbooks for the Identification of British Insects. The latest two additions undoubtedly conform to the high standard already set in previous Parts.

Part 9 of the Coleoptera volume deals with part of the Heteromera and includes rather over 100 species contained in the families Lagriidae, Alleculidae, Tetratomidae, Melandryidae, Salpingidae, Pythidae, Mycteridae, Oedemeridae, Mordellidae, Scraptiidae, Pyrochroidae, Rhipiphoridae, Anthicidae, Aderidae and Meloidae. Mr. Buck, who has made a special study of this group, has taken into account recent important work since the publication of Kloet and Hincks' list (1945) and it will be noted that the genera *Tetratoma, Salpingus* and *Mycterus* have all been accorded family status. Two interesting and recent additions to the British list are included. The keys are straightforward and the use of underside characters for identification purposes has been avoided except when necessary (such as in the genus *Anaspis* with its curious abdominal appendages). Over 60 new and original line diagrams are included which greatly assist identification.

Part 2 of Volume I covers two complete orders, the Thysanura with two families and the Diplura with one, including 20 species in all. These insects are difficult to identify and the keys are necessarily dependent upon high power magnification. It is a pity that no indication is given of the powers used and that the diagrams lack any reference as to scale. The literature on these little known orders is extremely scattered and the author is to be congratulated in producing a precise guide to the British species.

L. S. W.

Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. 1954.

The Amateur Entomologists' Society

ANNUAL EXHIBITION

1954

SATURDAY, 25th September, from 2 p.m. to 5.30 p.m. at **BUCKINGHAM GATE CENTRAL SCHOOLS,** Wilfred Street, London, S.W.1.

ADMISSION FREE.

EXHIBITS. The Hall will be open from 10 a.m. for receipt of Members' exhibits. Bring along your specimens (any Order, living or set), equipment, apparatus, photographs, drawings, etc. If you require a large space, notify Meetings Secretary in advance. Please label clearly.

TALKS will include one on " Saturniid moths and larvae " by W. R. Smith, Esq., illustrated with coloured slides.

DEMONSTRATIONS. Members will demonstrate setting of coleoptera, diptera and lepidoptera.

GROUPS. Members of Groups who have been corresponding will be able to meet for discussion.

OVERSEAS MEMBERS' EXHIBITS will be shown.

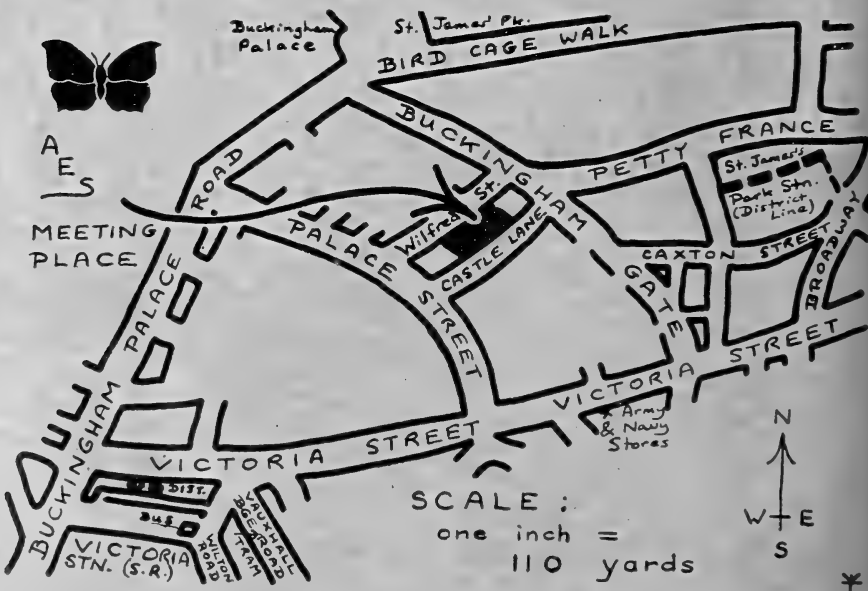
SURPLUS TABLE. If you have spare ova, larvae, imagines, equipment, books, etc., for exchange bring them along labelled with name, price, or exchange wants. No charge for use of this table.

ENTOMOLOGICAL TRADERS will be in attendance.

Offers of help and enquiries to Hon Meetings Secretary (K. H. Bobe), 19 Hengist Road, London, S.E.12.

BRING YOUR FRIENDS AND AN EXHIBIT!

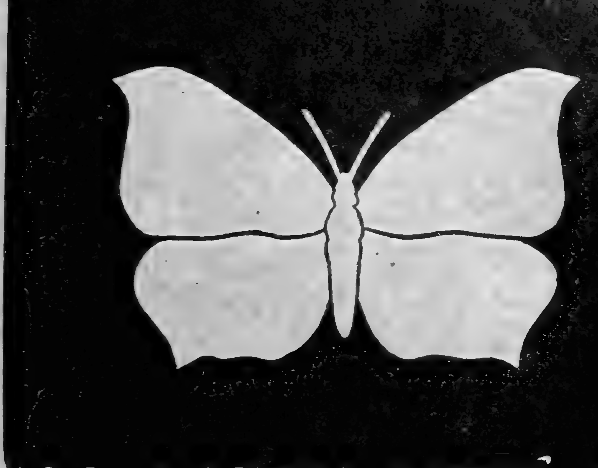
HOW TO GET THERE—



VOL. 13

No. 166

TOBER - - 1954



THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

EDITED by B. R. STALLWOOD

AES BULLETIN

No. 166

OCTOBER 1954

THE BEAN APHID AND ALLIED SPECIES

Most people have noticed the existence of aphids, and can recognise them for what they are, although they may not realise that there are numerous species of "Greenfly" and "Blackfly". Many aphids are pests of kitchen and market gardens, farm and orchard, where they may cause considerable damage to Beans, Beet, Potatoes, Cabbages and their kind; Plums, Apples, etc. They may blemish or even kill many ornamental and flowering plants, such as roses and chrysanthemums. Some species, like the Elder Aphis (*Aphis sambuci* L.) in the late spring, produce a sticky crust on the young shoots of their host plants. Many others produce deformities of one sort or another, and infestations can often be recognised by the crumpling of the leaves or the presence of a particular type of gall. For example, the Poplar Gall Aphid, also known as the Lettuce Root Aphid (*Pemphigus bursarius* L.), produces reddish sack-like galls on the petioles and leaves of the poplar; others, such as *Aphis ilicis* Kalt. on holly, *Ceruraphis eriophori* Walk. on guelder rose, produce marked leaf curlings. Apart from unsightly distortion, honeydew, excreted from the anus of the aphids, often forms spots on the leaves of infested plants, and provides an excellent medium for the growth of moulds, thus causing further unsightliness. The spread of virus diseases within a crop is also associated with the migration of aphids through the crop, although the full story of this migration is by no means fully understood yet.

The taxonomy of the Aphididae is, in many genera, still in an unsatisfactory state. One such genus is *Aphis* itself, which has been included in what is termed the "Black Aphid Complex". Other genera in this complex include *Pergandeida* Schout. and *Cerosipha* del Guercio, although only the black and dark brown members of these genera are included. Certain species, previously placed in the genus *Aphis*, have now been transferred to other genera. The genus *Aphis* is now believed by some authors to consist of about twenty-seven species, *A. fabae* Scopoli, the Bean Aphis, being the best known, most polyphagous and most widely studied. Previous to 1921, *A. fabae* Scop. was included together with a number of other distinct species, which have since been separated under the name of *Aphis rumicis* Linn.

Since the characters used in separating the species are so minute, large numbers of specimens from a given host plant (a clone if possible) must be examined carefully and various measurements taken to ensure accurate identification. These measurements include, for example, the length of the marginal hairs on the abdomen, the length of the cornicles, cauda and antennal segments, and if a sufficient number of a particular stage are measured, the results can be compared statistically with similar measurements from another species.

Some species are fairly easily distinguishable from *A. fabae* Scop. For example, *Aphis ilicis* Kalt. is dark brown, forming small colonies on holly, and causing rolling of the leaves; it is holocyclic (see below), and will not transfer to other plants. On the other hand, *Aphis acanthi* Schrank from the thistle (*Cirsium arvense*), and *Aphis euonymi* Fab. from Black Nightshade (*Solanum nigrum*), are both black, and difficult to separate except by detailed microscopical examination.

Life cycles in the genus *Aphis* are of two distinct types:—

(1) *Holocyclic* in which the species live on one single species of host plant throughout the whole year, laying their eggs on the same species in the autumn.
Examples: *A. hederae* Kalt. on Ivy. *A. ilicis* Kalt. on Holly. *A. armata* Hausmann on Foxglove.

(2) *Heterocyclic* in which the species leave their primary or winter host plants in the spring and migrate to their secondary, or summer, host species, which are often numerous, subsequent generations returning to the winter host in the autumn to lay their eggs.
Examples: *A. fabae* Scop. overwinters on the Spindle Tree, Guelder Rose, and probably

other woody hosts, and migrates to numerous species of summer host. *A. euonymi* Fab. also occurs on Spindle Tree in the winter, and is found on *Solanum nigrum*, *Polygonum convolvulus*, and *Rumex crispus* during the summer, while *A. sambuci* L. exists on Elder during the winter and spring, and on the stems, leaves and roots of *Rumex* species during the summer.

Now a number of different species may lay their eggs on one winter host plant, and consequently a certain amount of confusion may arise. For example, on *Euonymus europaeus* (Spindle Tree) during the autumn, *A. fabae*, *A. euonymi*, *A. cognatella* (a brown holocyclic species) and possibly *A. acanthi* may lay their eggs. Similarly, *A. fabae* and *A. viburni* lay their eggs on *Viburnum opulus* (Guelder Rose) during the autumn. Whether or not hybridisation between species occurs is at present unknown, but it is hoped that, in the near future, experimental work will produce an answer to this question and help to clear up some of the difficulties.

The two major problems which work on this genus aims at solving are:—

(1) What is the real status of certain of the known "species", and how many species are there?

(2) Can a satisfactory key for the identification of the species be made?

The solution of the former problem depends not only on microscopical examination (which unfortunately needs a statistical approach), but also on the knowledge of host plant relationships, together with an investigation of the possibilities of hybridisation between "species" and variations due to nutrition. So far, the few attempts at specific keys have been most unsatisfactory, but it is hoped that a solution to this may be found when the first problem has been solved.

Unfortunately, it is often difficult to obtain all the samples of aphids which would form a basis for detailed study, and certain species seem rather difficult to obtain in certain areas. The scarcity of "black" aphids in this area during 1953 was acute and, in consequence, little knowledge was obtained from the work done. Fortunately, the aphid populations are larger this year and some success has been obtained in the collection of the necessary colonies, but I have still been unable to find *Aphis euonymi* Fab. (which lives on *Solanum nigrum* and *Polygonum convolvulus*) in the South Nottinghamshire area. I would, therefore, be very grateful if any members of the Society who notice black aphids on any plants, other than beans, especially on *S. nigrum* or *P. convolvulus*, would be so kind as to forward them, with full data, to me at:—

The University of Nottingham,
School of Agriculture,
Sutton Bonington, Loughborough.

D. Lomas (2371).

●

TERMES BADIUS HAV. (ISOPTERA TERMITIDAE)

This common termite in Pretoria is easily distinguishable from the other members of the genus *Termes*, by a characteristic rectangular tooth on the left mandible of the soldier caste.

On the 26th of June 1954, I decided to dig out a nest, or termitarium, of this species, mainly for the purpose of collecting termitophils. The nest was that of a strong and probably long established colony. After digging down about a foot or so below the surface of the soil, and in a position slightly to the west of the main hillock of sand, which forms the above-ground indication of a termitarium, my spade suddenly sank into the softness of the fungus garden, the main source of food for the colony and also the breeding place for the eggs.

After removing the surrounding soil, practically the whole fungus garden could be taken out undamaged. Its overall size was about one-and-a-quarter cubic-feet, and in the centre of this was the royal cell, the interior measurements of which were roughly $6'' \times 3\frac{1}{2}'' \times 1\frac{1}{2}''$, and constitutes the main axis around which the activities of the nest revolve. The length of the queen in this case was, roughly $4\frac{1}{2}''$ and her cross-section was roughly $\frac{1}{2}$ sq. inch. The king was found beside her and was slightly more inflated than the normal flier caste.

The following castes were present within the termitarium: the royal caste, viz., the king and the queen, which were also the only fertile forms found in the nest. The sterile castes were represented by: the soldiers, present in exceedingly large numbers, and easily recognisable by their large sclerotized heads and mandibles: and the workers which were not so numerous.

The complete absence of sex reproductor forms of any type, except for the king and queen, was something which really interested me, because a few days earlier, while examining a nest of *Trinervitermes*, large numbers of nymphs with wing-buds were seen—the future fliers. Something which may interest junior members and even some seniors, perhaps, is the shape of the head in the soldiers of *Trinervitermes.* Here the head is lengthened to form a nose or snout under which lie the mandibles which are very reduced (this type of soldier is called a "nasutus").

The noise made by the soldiers of *T. badius* resembles grains of rice being dropped at a moderate pace on to a taut piece of brown paper and is produced by their heads, moved rapidly up and down in the passages of the termitarium or fungus garden, and in this way beating the floor and ceiling of the passage alternately.

Unfortunately, no worthwhile termitophils were found but the experience of seeing the structure and style of this particular type of termitarium was enlightening in itself.

DANIEL W. RORKE (2168).

PAIRED FEEDING OF LEPIDOPTEROUS LARVAE

The great difficulty in attributing any importance to the habits of larvae in captivity, is that one is apt to lose sight of the fact that it does not necessarily follow that the same thing happens in the wild state. In dealing with a native species there is always the possibility of going out and observing its behaviour under free conditions, and then comparing them with those of the restricted conditions of captivity. Where foreign species are concerned, however, the opportunity for amateurs to do this is so remote that it would not be out of place to say that it is impossible.

Over a period of years of rearing and breeding exotic Saturniidae I have noticed a marked tendency of some species to feed in pairs. Probably others have seen the same thing. In some but not all cases the larvae have been gregarious in the early stages. It has usually been in the later stages of development that this tendency to move about and feed in couples has been most noticeable. Although belonging to the same brood, it is not unusual to find that one of the couple is in a more advanced state of development than its companion.

The number of occasions on which this has been noticed seems too great for it to have been accidental. Furthermore it has never applied to all the larvae in a cage. For example with 12 larvae perhaps 8 would be feeding in couples and the remaining 4 singly. Out of curiosity I have on occasions separated a couple, only to find them together again later on. I feel that in such cases there would be some justification for assuming that they had a desire for companionship.

In the case of larvae that are naturally protected by the possession of urticating spines, or an unpleasant smell or taste, the congregation of a number of larvae in a small area would afford additional protection, because having found one unpalatable the enemy would hardly be likely to repeat the experiment with another member of the group. Unfortunately we have no evidence that these same species exhibit any desire to feed in couples in their wild state, and if they did two would hardly afford the same protection as a small colony.

How tempting it is to try and build up a case for sex attraction. Yet if it were proved to be so, surely it would be an encouragement of inbreeding, thereby undermining Nature's effort to ensure the survival of a species.

By dissection the professional could undoubtedly provide the answer. Another possibility would be the segregating of the couples and noting the sexes on emergence. Limitation of space often hampers the amateur in matters of this kind, particularly when he is already engaged on some other line of enquiry. I must admit that on more than one occasion the possibility of sex attraction has forced itself into my mind only to be banished almost immediately as unlikely.

Recent experiences with *Cirina forda* Westwood, a Saturniid from East Africa, have caused me to wonder whether or not ideas of this kind, which on the face of them appear ridiculous, should be dismissed so hastily. The larvae of this species are black with tiny scale-like markings above the spiracular line, and over the back so as to form a division between the segments. In the later stages some larvae possessed only pure white scales, while the remainder had a proportion of bright yellow scales above the spiracular line, shading to white as they approached the centre of the back. Such variations in colour, even within the same brood, are by no means a rarity and do not

as a rule indicate any difference in the resulting imagines. The strange fact is that in this case each of the yellow marked larvae was feeding in company with a white marked one, while the balance, all white, fed singly. (For those who would like to try and introduce something on the lines of the eternal triangle may I add that at no time did I see any attempt on the part of the solitary feeders to supplant the similarly marked partners of the couples by peaceful or aggressive means.)

Though exceptional it is not entirely unknown for larvae to be sex coloured, for in the case of the South American Nymphalid butterfly, *Callithea sapphira* Boisd., the males are blue while the female larvae are greenish or orange (Seitz, *The Macrolepidoptera of the World*, **5** (English edn.), p. 491). That being so, it would not be unreasonable to suppose that there could be sex colouration with the larvae of *Cirina forda*. Certainly it would provide an easy explanation of their habit of feeding and resting in differently marked couples.

With a glorious opportunity of segregating the couples during their final stages I was called away on official duties, and on my return two weeks later all had gone to earth for pupation and the opportunity was lost. Incidentally the accidental overheating of the greenhouse has since robbed me of the resulting pupae.

To have been able to carry out this little experiment would not necessarily have supplied the answer as to why they feed in couples, but at least it would have eliminated one of the possibilities. Even if it had been found that in every case the couples were of opposite sex, it does not follow that they would have paired together in after life. The possibility of mating is controlled by the time of emergence. One might, however, have had some justification for thinking that even before the full development of the sexual organs, the larvae possessed some form of sexual instinct.

For those who breed lepidoptera without attempting any form of experiment, may I suggest that should they discover in their cages several cases of larvae showing a tendency to feed in pairs in their final instars, they may find it interesting to segregate the couples even although they show no difference in marking.

W. R. Smith (1641).

LIGHT ON THE STOEP

It was Alfred Russel Wallace who, when he was in Borneo, first discovered the potentialities of a lighted white-walled stoep (verandah); he states that on one occasion he took two hundred moths, of one hundred and thirty species, during one evening.

It so happens that in South Africa last summer (October to March) I had the good fortune to possess a small white-walled stoep illuminated by a 100 wt. lamp, on which I was able to make numerous interesting captures. It is of interest that the summer before I was living in a house where my hostess had installed a yellow light, in order not to attract insects; this was a new idea to me but it certainly worked, for I took no insects there. It was not entirely a matter of poor illumination, for the light allowed one to read quite easily.

To return to my own stoep. During October and November moths and beetles were present in about equal numbers. I was surprised to find how few of them circled round the lamp; for the most part they settled on the walls. Many of the moths and some of the beetles just settled there and stayed put. Were they sitting and thinking or just sitting? I do not know enough about moths to tell what they were: most were certainly Noctuids, many were Geometers, and some were micros. Occasionally a hawk moth similar to our Convolvulus would spend a short time there, and once one like our Oleander appeared; a broad-winged moth resembling our "Old Lady" was often present, sometimes as many as four at a time.

During these two months Lamellicornes were the commonest beetles, mostly of the Cockchafer type, but occasionally a big Rhinoceros beetle would boom in, bang against the wall and fall helpless on its back. Many of the smaller types did the same, only to be seized upon by a swarm of minute ants, known locally as "sugar ants", who would immediately overwhelm them, gradually dismember them and carry away the bits. Why has evolution treated them so badly? Out in the open, quite apart from hitting anything, they always seem to land on their backs. I have watched them for at least twenty minutes struggling to regain their feet, all the time completely at the mercy of their numerous enemies.

Next in number to the Lamellicornes were the Clicks, of which at

least six different species were plentiful. Heteromera, mostly small ones, were plentiful, but one larger one, which closely resembled our Carabid, *Eurynebria complanata* Linn., in size and colour was also quite common. Longicornes were not plentiful, although during the season I took altogether twenty-one different species. Carabidae were never plentiful, but on many evenings a few Brachini turned up; they were black, with yellow spots on the elytra, slightly larger than our *Brachinus crepitans* Linn. I never saw one let off its guns. More interesting were members of the genus *Drypta*, with an elongated thorax and green or brown elytra with a shot silk lustre; of these I took six species. But the most interesting were the *Paussidae*, an aberrant family in which some genera have only two joints to the antennae, the second being balloon-like; I took three different species, of which the commonest had these peculiar antennae.

A few members of other groups were usually present; for instance, green Lace-wings very like the common English one, while on two occasions I took a much larger red-bodied one. A brown Lace-wing only appeared two or three times. Large, green Praying Mantids (probably *Miomantis semialata* Sauss.) were on tap most nights; once I was about to pick a Longicorne off the wall when a Mantis slipped in under my fingers and snapped it up; a flip on the head taught him to mend his manners. Curiously enough this was the only time during the whole season that I saw one attempt to take an insect; mostly they spent the whole time in fruitless attempts to climb the wall; with difficulty they would climb up about eighteen inches, then fall off or fly to another spot to try once more. Three or four Ant-lions were often present, all of the small *Cueta* type.

On most evenings two or three frogs came along. Do they know that insects are attracted by light or are they themselves so attracted? They were rather amusing; their tongues shot out so quickly that one could never see them; there was a faint click and the insect about two inches in front of them disappeared. I used to amuse myself by dropping Cockchafers which were rather too big for them just in front of them: sometimes they couldn't manage them at all but occasionally they succeeded in getting them down, to suffer from obvious indigestion afterwards. To my surprise they would never take a stationary insect; I have several times seen them follow a running beetle but, if the beetle stopped dead, they simply went on past it.

On two or three occasions during these two months we had a swarm of winged Termites of a large type (probably *Amitermes atlanticus* Fuller), the body about one inch long with a wing expanse of about three inches, but only once were they in such numbers as to drive us indoors and then only because they fell into our food.

After November the number of Lamellicornes began to fall off and after Christmas they practically disappeared. The numbers of Clicks, Heteromera and Carabidae kept up, however, and Staphylinidae began to be common. On two occasions these last were so numerous as to become a nuisance; I hope Mr. H. R. Last (117), to whom I send all my Staphs., realised that it was soup which was adhering to some of them or he might have been misled into thinking that he had something new.

The species of Longicornes changed from month to month, with the exception of two, *Xysterocera marginalis* Goldf. and *Apomocyna binubila* Pasc., which appeared sporadically throughout the season.

During the last two weeks of March the only beetles seen were a few Carabidae and an increasing number of Staphs, although an innovation was the appearance of a few aquatics, both Dytiscidae and Hydrophilidae. Throughout the month, however, there were hundreds of minute bugs and Diptera on the walls.

Weevils were never common; in fact, all that I took belonged to the curious family Brenthidae, narrow and elongate with, in the males of some species, very prominent mandibles. Altogether I took fourteen of them, of five different species.

One evening I noticed a most curious insect. It had a long heavy body with comparatively short wings, causing it to fly very clumsily. At first I took it for a Dipteron, but the venation was against this: then I found that it had a pair of minute elytra. Could it be an Ear-wig? But it had no forceps and, again, the venation was against it. Eventually I ran it down as a beetle of the family Lymexylonidae (*Malacodermata*), *Atractocerus brevicornis* Linn. I took five specimens, varying in body length from 35 to 45 mms. and from 25 to 35 mms. in wing expanse.

As in England, warm, cloudy nights with a hint of thunder were the best ones, but I was surprised to find how many moths appeared on cold nights even with heavy rain: one would think that beetles would, but it was not so. Has anyone ever explained why so few insects come to light on moonlight nights? Are they attracted by her light and so fly as high as they can towards her?

I have now been out in S. Africa for six years and on the whole had been disappointed by the small number of insects taken at light, but the season just described made ample amends. A. H. NEWTON (1140).

THE BEHAVIOUR OF ADULT LEPIDOPTERA IN WINTER

At the approach of winter the majority of entomologists seem to follow the example set by many of the insects they study, and retire into an inactive state. This is particularly true of the students of Lepidoptera, many of whom, through lack either of knowledge or of initiative, or a little of both, permit the winter to pass without taking advantage of the opportunities which that season offers.

A considerable number of species of lepidoptera pass the winter in the adult stage, a few of them being purely winter insects, not appearing as adults at any other time. The remainder are in a state of hibernation. These hibernating species may emerge from the chrysalis as early as July, and either retire into hibernation almost at once, or remain active until late in the autumn. They leave their winter quarters in the spring, becoming active again as soon as the weather improves, and may be found until the end of April or even May. Some of these insects have an adult life of from eight to ten months, yet the habits of many of them are little known and even their distribution in the country imperfectly understood. I refer here in particular to that large group of small moths known as Micro-lepidoptera, which have never found favour with the majority of entomologists.

During the latter part of December and the first week in January last, I devoted three afternoons and one whole day to the business of collecting hibernating moths in our Gloucestershire woods and studying the situations chosen by them for the purpose of hibernation. Later in January, I devoted two afternoons to a different type of country.

In all, 373 adult specimens of Lepidoptera were found; 2 species of butterflies and 24 species of moths, the latter including one species, *Gracillaria betulicola* Hering, hitherto unrecorded from Gloucestershire, of which I obtained fourteen specimens. This interesting mass of material was collected from three woods and an open valley, in which deciduous trees only were to be found in the section worked. Two of the woods were on hillsides, one with a northern aspect, the other facing south-west, whilst the third and largest was situated in comparatively flat country. The different situations of the woods made little difference to the numbers of insects found, though certain species were restricted to one or other of the woods, this fact being in all but one instance attributable to the presence or absence of a suitable food plant. The exception was *Gracillaria sulphurella* Haw. which was found in one wood only and there in extreme variety and great abundance.

Armed with a beating tray and a stout stick, I searched out yew trees and other thick cover, subjecting all to a vigorous beating. In the case of the open valley, I selected a patch of thick bracken near a row of alder and willow trees and thoroughly thrashed the thicker clumps over the tray. This was very productive, particularly as regards the genus *Gracillaria*, no fewer than three species appearing on the tray at the same time; namely, *G. elongella* Linn., *G. stigmatella* Fabr. and *G. semifascia* Haw.

In general, I found that certain species favour yew trees in preference to any other cover, whilst others were rarely to be found in anything but spruce. The lower branches of the two outside rows of trees in a spruce plantation were very productive, but farther in there was very little. Yew trees varied in their productivity, thin straggly trees yielding nothing, whilst the very thick ones and those in which masses of dead leaves had collected were extremely good. Cypress harboured nothing, but one isolated juniper, a very thick one, yielded a large number of specimens of *Acrocercops brongniardella* Fabr., a species which was not found in any other situation. The most important requirement appears to be very thick cover free from an excess of moisture.

The interesting fact that in mild weather, some at least of the hibernating insects become active, was well demonstrated by the results of my collecting. One of the woods—the one,

in fact, with the northern aspect—was visited twice. The first time, late in December, I started working along the hillside from one end, but only succeeded in covering a part of the wood. On the second visit, in January, I began from the opposite end, and by chance started to beat again one of the trees I had worked on my previous visit. Realising this, I was about to tip the rubbish from the tray unexamined when I noticed a movement which turned out to be a moth. Further scrutiny revealed several more and after such a surprising discovery, I worked the tree carefully, with considerable success and then visited several that I had beaten on my previous visit with like result. It would appear that considerable activity had taken place between my visits. This raises a very interesting point. Do insects hibernate when the temperature drops below a certain level and become active again when it rises above that level, or is there some other controlling factor involved? From the fact that insects had been active between the last week in December and the first week in January, a period during which the weather was unusually mild, one might infer that temperature was the controlling factor. One must not forget however the behaviour of the many insects which hibernate as early as August and are not seen again before the spring. If temperature alone were the controlling factor, surely the warm weather which we often experience during September, and sometimes even October, would tempt these insects into some show of activity. There is an opportunity here for much interesting research. Unfortunately, the same can be said of almost every aspect of insect behaviour.

In the following list of species taken, I have given the type of cover from which each was obtained.

Nymphalis io Linn. Spruce.
Polygonia c-album Linn. Spruce.
Scopelosoma satellitia Fab. Yew.
Xylina ornitopus Rott. Yew.
Scoliopteryx libatrix Linn. Yew.
Sarrothripus revayana Scop. Yew, Spruce and Ivy.
Platyptilia cosmodactyla Hübn. Yew, Spruce and Bracken.
P. acanthodactyla Hübn. Bracken and Gorse.
Pterophorus monodactylus Linn. Yew and Juniper.
Peronea ferrugana Schiff. Yew.
P. cristana Fab. Yew and Spruce.
Depressaria arenella Schiff. Bracken and Juniper.
D. applana Fab. Yew, Juniper and Gorse.
Simaethis pariana Clerck. Gorse.
Zelleria hepariella Staint. Yew, Spruce, Scots Pine and Juniper.
Acrocercops brongniardella Fab. Juniper.
Gracillaria cuculipennella Hübn. Spruce, Scots Pine and Juniper.
G. sulphurella Haw. Yew, Spruce, Scots Pine and Juniper.
G. elongella Linn. Bracken.
G. betulicola Hering. Spruce, Scots Pine and Bracken.
G. stigmatella Fab. Scots Pine and Bracken.
G. semifascia Haw. Spruce and Bracken.
Epermenia chaerophyllella Goeze. Spruce and Juniper.
Cerostoma radiatellus Don. Yew, Spruce, Scots Pine and Juniper.
Acrolepia granitella Treits. Bracken.
Lyonetia clerkella Linn. Yew, Spruce and Bracken.

A. F. PEACEY (2170).

FURTHER NOTES ON THE LARVAE OF *ARCTIA CAJA* LINN.

Since writing my notes on the above species (*Bull. amat. Ent. Soc.*, **13**: 61) I have had occasion to modify my theories regarding the situation in which the larvae hibernate.

Contrary to my usual practice, I did not cut down the stems of my herbaceous plants last autumn. I hoped that they would provide suitable retreats for at least one or two hibernating larvae. The chrysanthemums were ideal in this respect. The leaves withered and curled, but remained attached to the stems. In January, I cut down all the plants and examined them carefully. The chrysanthemums I examined leaf by leaf. I removed each leaf as I did so in order that I should not miss anything, but I found nothing—that is to say, I found all sorts of things, but no larvae of *Arctia caja*.

I kept a sharp look out for larvae in my garden this Spring, and I found quite a considerable number more or less where I had expected to find them. I found them on the boundary fence and on posts, and in fact on anything which stood upright, *but* with one exception they were all found resting in the sun within a few inches of the ground, which seems to indicate that they hibernated on the ground. The only exception I found near the top of the fence, but this was found much later in the day, and had had plenty of time to crawl up.

Next winter I am going to make a thorough search for hibernating larvae, and provide them with suitable accommodation above the ground and on the ground; near the fence and bushes and well away from them. When I speak of "suitable accommodation" I mean, of course, suitable according to my ideas. Whether it will appear so to wandering Tigers is another matter.

Since writing my last notes, I have heard from a member who has beaten two small larvae of *A. caja* from elm.

G. S. E. Cross (1453).

MORE ABOUT *CITHERONIA BRISSOTII* BOISD. (LEP. CERATOCAMPIDAE)

As our household was away last Christmas an office colleague, who in his younger days was interested in entomology, but is now mainly devoted to botany, kindly undertook to care for my larvae. He has on several occasions in the past had some of my surplus larvae to rear, and his cat has always displayed a keen interest in the cages. It was quite natural therefore that when *brissotii* arrived and the family were admiring the very grotesque larvae, Puss as usual pushed his way forward intending not to miss anything. When within about three feet from the cage he spotted one of the larvae, then about four ins. long. He dropped flat on the floor with his hair bristling, slowly edged away until about five feet from the cage, then apparently feeling safe got up and went to the far end of the room. On several occasions over the Christmas the cage was put on the floor for his inspection and each time he behaved in the same way. Nothing would persuade Puss to get nearer than three to four feet.

As an experiment, one of the sprays of food, on which one of the larvae was feeding, was taken from the cage and pushed slowly towards him. For a moment or two he looked at it, then unable to stand the strain any longer, leapt in the air and fled from the house.

We have no cat with which to try a similar experiment, but it seems that it is not without justification that the *Citheronia* larvae are sometimes called " Horned Devils."

W. R. Smith (1641)

[*Bull. amat. Ent. Soc.*, **13**, 20. For *brisotti* please read *brissotii*.]

PRACTICAL HINTS—OCTOBER

Day work.—Dig for pupae, selecting trees on roadsides, parks and open places. Gently raise the turf from the trunk outwards; the majority of pupae will be located fairly near the trunk and when the turf comes away easily and the earth is soft, they may be dislodged by shaking, whilst others will be exposed under the turf. When you have finished a tree, always replace the earth and turf as neatly as possible, firstly because the activities of an entomologist will be tolerated more if he respects the countryside, and secondly because the trees will be in better condition for the pupa hunter next time!

The most productive trees include Oak, Lime, Poplar, Elm, and Beech. Hawthorn provides good hauls if the trees are large, and in the open. Willow is always reputed to be a good tree for digging but my experience has always been that more have been found under loose bark or moss on the lower part of the trunk than in the earth at the roots. This, however, may not be general, and may be due to the fact that the soil round my local willows is mainly heavy clay and stones!

Larvae.—Many larvae are still to be found after dark by the aid of a good torch or vapour lamp. *Habrosyne derasa* Hueb. (Buff Arches) on Bramble. *Melanchra persicariae* Hueb. (the Dot) on the same plant. In general the large ones will pupate this year, and the small ones hibernate; this, of course, is only a very rough guide to the beginner.

The larva of *Atolmis rubricollis* Linn. (Red-necked Footman) is to be found on lichens growing on Fir, Oak, Beech and Elm. Also on lichens and moss on walls, usually those in the vicinity of elms.

Night work.—Light will continue to attract quite an assortment of insects — *Chloroclysta miata* Linn. (Autumnal Green Carpet), *Colotois pennaria* Linn. (Feathered Thorn), *Oporinia autumnata* Bork. (Autumnal Moth), *O. dilutata* Schiff. (November Moth), etc.

Ivy bloom will be the main attraction for the noctuids, and on a good night one may fill as many boxes as the heart desires. *Allophyes oxyacanthae* Linn. (Green Brindled Crescent) with its dark variety (*capucina*), *Conistra vaccinii* Linn. (Chestnut), *C. ligula* (Dark Chestnut), etc.

Sugar will attract these noctuids, of course, but will not be well patronised if there is a good clump of ivy in full flower nearby! R. V. Aldridge (262)

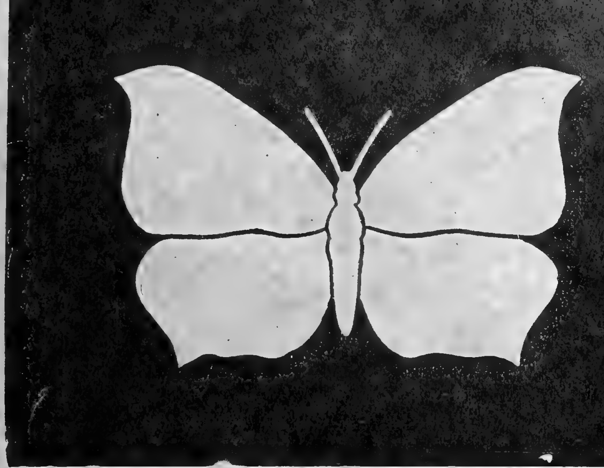
Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. 1954.

VOL. 13

No. 167

•

VEMBER - - 1954



THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

JUNIOR MEMBERS' NUMBER

EDITED by B. R. STALLWOOD

AES NOTICE
WHERE TO WRITE

Membership applications, offers of help to: D. OLLEVANT, *3 Salcombe Drive, Morden, Surrey.*

Advertisers to: L. W. SIGGS, *10 Repton Road, Orpington, Kent.*

Changes of address and non-arrival of Bulletins *to:* B. L. J. BYERLEY, *48 Elmgrove Road, Harrow, Middlesex.*

Offers to lead Field Meetings, exhibit, etc., to: K. H. BOBE, *19 Hengist Road, London, S.E.12.*

Manuscripts, drawings and books for review to: B. R. STALLWOOD, *19 Southfield Gardens, Strawberry Hill, Twickenham, Middx.*

Subscriptions (12/- per annum, 6/- for Juniors) to: R. W. WATSON, *15 Halstead Road, Bitterne, Southampton.*

Youth matters to: S. M. HANSON, *167 Gunnersbury Park, London, W.5.*

AES

Members can help the Society in several ways:—

(a) By dealing with advertisers and mentioning the *Bulletin.*

(b) By bringing in new members. (Subscription, 12/- per annum. Juniors, 6/- per annum.)

(c) By buying AES publications and suggesting Public Libraries should buy them.

(d) By friendly co-operation with other members.

(e) By taking just that extra bit of trouble required to record happenings of note for the *Bulletin.*

AES BULLETIN
No. 167
NOVEMBER 1954

EDITORIAL

Although the response to the Junior Members' Number was not 100%, as in 1953, we nevertheless congratulate those who contributed such interesting material to make up the greater part of this issue.

•

HOVER FLIES

For a whole minute the dark brown bee-like insect was poised motionless in mid-air, a foot away from my nose, gazing steadily at me with its large brown eyes. Then, without warning, it was gone—so quickly that I never saw it fly away.

The day was warm and sunny, one of those days we sometimes get in June. Wandering rather aimlessly down country lanes, I stopped here and there to look more closely at anything that caught my interest. It was on one of these occasions that this insect suddenly appeared in front of me. I later found that it was a drone-fly, one of the hover-flies, and, by its action of remaining poised in the air, it aroused my curiosity.

I began to take a deeper interest in hover-flies and found that there are many kinds each with its own particular characteristics. Some are large and hairy, some are small and brilliantly-coloured, while others are medium-sized and extremely swift fliers. Their sizes range from that of a medium-sized bumble-bee to that of the common house-fly. Some mimic bees and wasps to escape attacks by birds and frogs. They are called "hover-flies", because their frequent mode of flight is one of hovering.

Although hover-flies are very interesting, they form only a very small proportion of the British fly population. True flies can be distinguished from other insects by their possession of only one pair of wings as distinct from the latter's two pairs. In place of the second pair of wings possessed by other insects, flies have a pair of drum-stick-shaped "balancers" or "halteres" behind the first pair of wings. Hover-flies comprise the main part of the family Syrphidae.

Before describing the individual flies, let me give a brief outline of their life histories. The life-cycle begins with the eggs laid by the female adult, then come the larvae, the pupae and, finally, the perfect adults. The eggs are generally microscopic and are laid in a large variety of media, ranging from rotten wood to stagnant water. The larvae, or grubs, often assume rather peculiar forms. The Rat-tailed maggot found in stagnant water, for example, is about half-an-inch long and possesses a long tapering tail which gives it its name. After a variable period of feeding, the larvae pupate and enter the quiescent pupal or transition stage. One of the minor mysteries of nature occurs here, since an extremely drab-looking maggot can go into pupation but a most gaudily coloured adult insect may emerge. The pupae are usually the same size as the corresponding larvae and are often devoid of any characteristics other than being roughly cylindrical and dark-coloured. The adult insect emerges after a certain period of pupation (variable with different species) and goes off in search of food. This nearly always consists of nectar from flowers, since all hover-flies are phytophagous. The insect has no permanent home but wanders about from flower to flower in the sunshine, taking refuge in low herbage when the weather is unfavourable.

Since there are over two hundred species of hover-flies, it is obviously impossible to describe them all in this short article which, therefore, will be confined to those most common and conspicuous in the North of England. Of these, a Drone-fly (*Eristalis pertinax* Scop.) is probably the most striking, as it greatly resembles the drone of the ordinary honey-bee. It is about three-quarters of an inch long, dark brown in colour and frequents yellow or white flowers from March to November. Its flight consists of periods of hovering, interspersed with rapid, apparently aimless darting. On account of its resemblance to drones, it has often been mistaken for the ordinary honey-bee and it is probable that the "oxen-born bee" of the ancients was really this fly. (See Judges 14.) Another species of *Eristalis*—*intricarius* Linn.—shows two interesting variations. The typical form is something similar to *E. pertinax* Scop.,

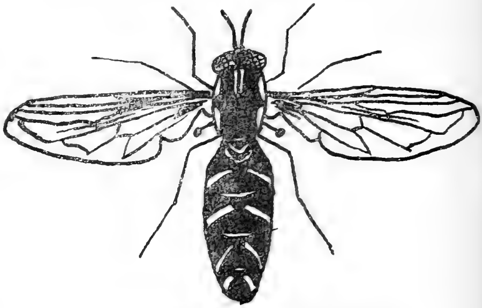
but the variations have long black abdominal hairs with either red or white hairs at the tip. In this way the red and white-tailed bumble-bees are resembled.

A great number of fairly small hover-flies found on large clusters of flowers have one thing in common. They nearly all have a black abdomen with yellow bands or lunules. These belong to the sub-family Syrphinae, and are often called "flower-flies". Some of the larger species of these can be mistaken, at a distance, for wasps. However, as wasps do not hover, it is fairly easy to decide whether it is a wasp or a fly. One of these, *Catabomba pyrastri* Linn., is a striking example and often hovers in one place for minutes on end. Although its abdomen is black and pale yellow, it appears grey in flight owing to the rapid vibration of the body.

Xanthogramma ornatum Meigen is a very brilliant and attractive fly, but it is not easily found. The lunules or markings on its abdomen are a bright shining yellow and contrast vividly with the gleaming black background. Another hover-fly of unusual appearance is *Rhingia campestris* Meigen, which has a peculiar "snout" projecting in front of its head. This "snout" is really a prolongation of part of the head and should not be confused with the tongue which is a much thinner, inconspicuous and retractible organ beneath the "snout". The fly is about half-an-inch long and mainly orange in colour. It can be found on low herbage plants, such as Red Campion and Hogweed, from April or May to October.

Volucella bombylans Linn. is another good example of mimicry. There are several forms of this fly and, in fact, it is not often that two specimens of *V. bombylans* are identical. Several species of bumble-bees are imitated and the larvae of the fly live as scavengers in the bees' nests. Perhaps I might also mention *Volucella pellucens* Linn., a large shining black hover-fly with a broad white band across the base of its abdomen. This is a very difficult insect to catch on account of its great agility and timidity.

An unusually good example of mimicry of wasps is found in the genus *Chrysotoxum* Linn., particularly the species *C. festivum* Linn. Its abdominal markings are very like those of a wasp, it is the same size as a wasp and, moreover, has long antennae like the wasp. The last of these is a feature peculiar to the genus *Chrysotoxum* Linn. There are, of course, several other species of this genus which exhibit similar mimicry though not quite so effectively.



CHRYSOTOXUM FESTIVUM.

All these flies which are here described are common in Britain, although in some cases they may not be easy to find. Indeed, some may only be discovered when extensively searched after, but patience and energy are nearly always rewarded by the eventual discovery of the required specimens. One word of advice—always choose a warm sunny day, otherwise disappointments will predominate. Although many hover-flies mimic bees and wasps, they cannot sting or bite and can be handled with the greatest impunity—but please don't mistake a wasp for a hover-fly!

R. Underwood (2338*).

[For further information on Syrphidae, and keys to all our species, members are referred to R. L. Coe's recent work, *Handbooks for the Identification of British Insects*, Vol. **10**, Part 1, published by the Royal Entomological Society. Price, 17/6.—T.R.E.S.]

SCHOOL NATURAL HISTORY SOCIETY REPORTS

Two interesting Reports have recently been received.

Taunton School N.H.S. has produced a duplicated pamphlet for 1953, which, in addition to Ornithological and Botanical items, has an article of interest to entomologists entitled "The Influence of Weather conditions on the flight of Moths", taken from Mercury Vapour trap records, and illustrated by graphs.

The third issue of *The New Biologian*, the magazine of Lancaster

Royal Grammar School N.H.S., is a printed book of 26 pages with photographic illustrations. It is edited by one of our members, R. UNDERWOOD (2338*), and contains an article by him entitled "Hoverflies" which he has kindly allowed us to reprint in this number. In addition to short articles on a wide range of natural history subjects, there is a further note on the collecting of bees, wasps and allied insects.

Both publications are a credit to the societies which produced them.

LEPIDOPTERA IN THE NEW FOREST

With a few of my friends, I planned a week's expedition to the New Forest to catch Lepidoptera at the end of July last, with our headquarters at Lyndhurst. Although the weather was bad at the beginning of the week, it cleared towards the end, and we were pleased with our captures.

We saw many Silver-washed Fritillaries (*Argynnis paphia* Linn.) during our stay, of which three were var. *valezina* Esp. On the first day, we explored the heathland opposite our hotel, and found a great abundance of Silver-studded Blues (*Plebeius argus* Linn.) not to mention specimens of many of the usual heathland butterflies and moths obtainable at that time of year. We also found a few Purple-Bordered Gold moths (*Sterrha muricata* Hufn.) flying by day, but they had not been disturbed. This was interesting, as Richard South states that these attractive little moths fly only at dawn. On the second day, it poured all day and although we did make some attempts at looking at tree-trunks for moths we were unsuccessful.

On the third day, it still rained, but, nothing daunted, we set out across the heath. Suddenly one of us noticed a batch of eggs on the undergrowth, and, on closer examination, more eggs were found. These, which have been identified as those of the Fox Moth (*Macrothylacia rubi* Linn.) have been bred with almost 100% success to the third moult. On the way back, we passed a plantation of Scots Pine, and we thought that we should inspect the trunks. Just as we were giving up all hope, one of our number found a female Pine Hawk (*Hyloicus pinastri* Linn.), freshly emerged. Two days later, I found two Pine Hawks, one male and one female, in the same place. The female was possibly the one liberated two days previously. However, she laid us eggs, which have been reared with moderate success to the third moult.

We found most of the woodland and heathland butterflies, and various species of moths, such as Small Purple Barred (*Phytometra viridaria* Clerck), Drab Loopers (*Minoa murinata* Scop.) and Barred Hooktips (*Drepana cultraria* Fab.). An odd Four-Dotted Footman (*Cybosia mesomella* Linn.) and Purple Bar (*Lyncometra ocellata* Linn.) were also captured.

While out at night, nothing of interest was captured, the most interesting being a Bordered Beauty (*Epione repandaria* Hugn.), although sugar was used. But at light several more interesting specimens were taken. At the blue lamp of the local police station, a Lappet (*Gastropacha quercifolia* Linn.) was taken. We used a rather primitive method for light, having all the bedroom windows open, with the bedroom and bedside lights full on. However, this method proved very effective, and I advocate it to anyone who lacks a light trap on holiday. By this method we obtained many specimens, of which the more interesting are mentioned here: Four-spotted Footman (*Lithosia quadra* Linn.), Scarce Footman (*Eilema complana* Linn.), Bird's Wing (*Dypterygia scabriuscula* Linn.) Broad-Barred White (*Hadena serena* Schiff.), Spectacle (*Abrostola tripartita* Hufn.), Yellow Tail (*Euproctis chrysorrhoea* Linn.), Peppered (*Biston betularia* Linn.)—but the most beautiful—a Peach Blossom (*Thyatira batis* Linn.)—was "the one that got away".

As for varieties and aberrations, we took several Five-Spot Burnets (*Zygaena trifolii* Esp.) which had only three spots, the two pairs being joined. This variety was only taken in one place. Then again a Ringlet (*Aphantopus hyperantus* Linn.) was taken, along with normal Ringlets, which was verging upon var. *arete*.

Recently we have taken several Common Emeralds (*Hemithea strigata* Muell.) which have been a dull yellow colour instead of green, but they most certainly are not faded. The other variety is one of the Wall Brown Butterfly (*Pararge megera* Linn.), which has the "eye spot" on one side considerably smaller than that on the other.

I should be interested if anyone could give me further information about these varieties.

J. J. S. WATSON (2314*).

EXPERIMENTS WITH THE MUSLIN MOTH, *CYCNIA MENDICA* CLERCK

In the *Bull. amat. Ent. Soc.* **12**, 77, I described some experiments with the Muslin Moth (*Cycnia mendica*). A few further notes might be of interest now that the moths have hatched. For details of the experiments the reader is referred to the previous article.

Group A. Sugar experiments. Ten caterpillars produced four pupae; two in cocoons, two bare. The cocooned pupae hatched on March 30th and April 4th 1954, both giving females (wingspan 37·5 and 35·5 mm. respectively), a deformed female hatched on March 29th from one of the bare pupae, and the other was found, on inspection (April 19th), to contain a dead female. The perfect females are of the usual form and of average size, so it appears the sugar had no effect.

Group B. Control group. Ten caterpillars produced eight pupae; three in cocoons, five bare. One male (about March 28th) and one female (March 30th), and one deformed female (April 6th) from bare pupae. On inspection of the remainder (April 19th), one dead male found in the cocooned pupa, and all the bare pupae had dried up. Wingspans: male 33 mm., cocooned female 38·5 mm., bare female 34·5 mm.

Group C. Foodplant not in water. Ten caterpillars produced seven pupae, four in cocoons, three bare. A female (36·5 mm.) hatched from a cocooned pupa on March 29th. On inspection (April 19th) the cocooned pupae gave one dead male, one dead female, and one dried up; one dead female and two dried up from the bare pupae.

Group D. Perpetual darkness. No caterpillar reached the pupal stage.

Group E. Foodplant experiments. A female hatched from each of the four sub-divisions, E1, E2, E3, E4, on respectively 29th March, 31st March, 3rd April, 2nd April, with wingspans 31·5, 35·5, 32, 36 mm., that from E3 hatching from a bare pupa, the others from cocooned pupae.

In all, fourteen cocooned pupae gave one male, seven females, two dead males and one dead female; while thirteen bare pupae gave two females, two deformed females, and three dead females. From this it would appear that a cocoon while not absolutely necessary is certainly desirable. The high mortality would be due in part at least to the dry conditions under which the pupae were kept. None of the moths had any peculiar markings.

One surprising feature of the results is the large proportion of females. Of those which hatched the ratio is one male to eleven females; of all the pupae it is three to fifteen. Recently I have been learning the rudiments of statistics, and like all recruits to that branch of mathematics I have gone "figure mad", so I have tested the results to see if they are consistent with the hypothesis that the proportions of males and females are equal. Using the binomial distribution of probability, the chance of getting one male and eleven female moths in a sample of twelve, from a theoretical population in which there are assumed to be equal numbers of each, is 3 in 1024. Three males and fifteen females give a chance of about 1 in 320. Both these chances are very small, and it is fairly safe to say, therefore, that in the theoretical population of which these figures are samples, there was a greater proportion of females. This may be because the original female laid more female eggs, or that the female moths are tougher and more reach maturity, or maybe just chance.

Summarizing the results of the experiment then, two conclusions can be drawn. Firstly, perpetual darkness is detrimental to *mendica* caterpillars, though not necessarily so to other species, and secondly that *mendica* has a wide range of foodplants, a list of which has already been given. Further conclusions cannot be drawn with anything like the same certainty, though it would appear that there is some evidence for supposing that a cocooned pupa (of *mendica*) is more likely to produce a perfect imago than a bare one.

J. P. S. Pringle (2094*).

ADVICE ON MICRO-LEPIDOPTERA

Mr. S. Wakely (1860), 26 Finsen Road, Ruskin Park, S.E.5, has kindly offered to give advice on, and how to identify, the micro-lepidoptera.

He is unable, however, to undertake genitalia examination, and as some species can only be identified by this means, or by breeding, he cannot guarantee to identify all species.

THE BETROTHED, THE BRIDE AND THE SPOUSE

I had been collecting and studying butterflies and moths for eight years before I had my first encounter with the Bride.

To the layman this moth is the Red Underwing, but to the entomologist its Latin name, *Catocala nupta* Linn., is much more descriptive. The first name is the generic name, showing the genus to which it belongs, but the specific name, *nupta*, means "a bride", and if ever you see a newly-emerged female of this species at rest upon a tree trunk, you will agree it is an apt description for the pristine beauty of the delicate oyster-grey upperwings, the quivering antennae and the silky down of the first pair of legs with which the moth balances herself on the irregularities of the bark.

The day was September 8, 1935. We were fortunate in having some very beautiful pine woods less than two miles from home, and my father and I, as was our wont every Sunday, were on our way there, haversack on back and net in hand. I had gone a little further on in front, tapping the hedge with the handle of my net for the usual assortment of "pugs" and "waves" that usually flit out diffidently into the daylight when so disturbed. My father was what he used to call "just looking", but his powers of observation were such that he could spot even the most camouflaged of mimics at several yards' range.

I had become quite engrossed in my task of "beating" when I was suddenly distracted by a series of frenzied shouts and, turning round, I beheld my father running towards me at top speed with his hands clasped together before him. He really did look most comical. "Quick! a box!" He was really excited. I knew it could not be just any common-or-garden species he had espied. I had ridiculous thoughts of *Hyloicus pinastri* Linn. in my mind as I hastily extracted the largest glass-bottomed pill-box from my haversack.

My father was adept at catching butterflies and moths without a net, a fact which has stood me in good stead on many occasions when I have had the net and he was elsewhere at the time. Moths at rest he seemed to be able to hypnotize into his hands, and thus it was that, opening his hands, he now disclosed to my wondering gaze a sleepy female Red Underwing, obviously freshly-emerged, with not a scale on her wings out of place. Quickly I transferred her to the pill-box, nearly dropping the lid in my excitement, and she settled down quietly on the glass bottom, raising her wings slightly once to give me my first fleeting glimpse of the cherry-red underwings with their velvety black bands. The bride was captured.

Now, a bride must first be betrothed, and afterwards settles down (we trust) to a happy married life as a spouse; and that is exactly what we have in the genus *Catocala*—*C. promissa* Schiff., which means promised in marriage, or betrothed; *C. nupta*, a bride, and *C. sponsa* Linn., a spouse. The first of these three species is known as the Light Crimson Underwing, and is by far the least common of the three—not that any of them are common, in any sense of the word. But *C. promissa* is the one you are least likely to come across, unless, perhaps, you are able to take a walk regularly in the New Forest of Hampshire during July and August, when, if you are lucky, you may spot the newly-emerged imago at rest on an oak tree trunk at any time between dawn and the hour before dusk: or, if you care to walk there with a torch after dark during the early part of the summer, on occasions you may, perhaps, find its larva feeding on oak, boring into the buds during the early part of its life, but later devouring the foliage. The larva, greenish-tinged browny-grey, spotted with darker grey, and marked on the fourth, eighth and ninth rings with yellowish-brown, is often difficult to detect amongst the leaves.

If you want to discover the Betrothed in its pupal stage, you will have to dig just below the surface of the ground under oaks in late June and early July, and you may quite possibly turn up a rough-looking earthen cocoon of loose construction containing a purplish-brown chrysalis about an inch long, dusted with a bluish bloom. Should you find such a pupa you may be certain that it is *C. promissa*, as the larvae of both *C. sponsa* and *C. nupta* spin up their cocoons between the leaves of their food-plant. Such a spun-up cocoon on oak can only be that of *C. sponsa*, as *C. nupta* is not an oak feeder but is found only on willow and poplar.

The Spouse—*C. sponsa*, or the Dark Crimson Underwing, to give it its popular name, is more likely to come your way than the Betrothed, but

even so, it is not really profitable to seek it anywhere else but in the New Forest, as this seems to be its favoured haunt. Like *C. promissa*, *C. sponsa* has also been found in other counties adjoining Hampshire but only sporadically.

The Spouse shares with the Betrothed the propensity which characterises certain of the more local British moths—that of periodicity, or, in other words, it may be quite frequently seen in its own favoured locality in certain years, but exceedingly scarce or even totally absent in others. Neither *C. sponsa* nor *C. promissa* has been seen with any degree of regularity; both have been known to occur in the New Forest area in abundance in one season, and then not to have been seen at all for a considerable time except perhaps for one or two isolated appearances in some particular part of the Forest, and then its appearance was uncertain in the extreme.

The larva of *C. sponsa* may be distinguished from that of *C. promissa* by a row of raised red spots sprouting black bristles. It is also dusted with black generally and has a prominent hump on the eighth ring, and when fully grown is larger than the larva of *C. promissa*.

The Bride, *C. nupta*, is much more widely distributed, occurring in all the English counties from the Midlands southwards. Like its two next-of-kin, it is more abundant in some years than in others, but, although not common, cannot really be regarded as a scarce species.

The imago is exceedingly well camouflaged and thus difficult to detect when at rest on a tree trunk, and many are doubtless for this reason overlooked; but the Bride has a propensity which has, alas! caused it to fall victim to many a pill-box—its habit of choosing wayside telegraph-poles for a resting-place. "Up the pole" would best describe how most of the specimens to be seen in my fellow-entomologists' cabinets were caught, not to mention the 1935 specimen in my own collection which my father inveigled from a similar situation.

If you would rather breed your Red Underwings than catch them trespassing on G.P.O. property, look for the larva on willow and poplar from April to July, a dull dirty grey in colour, marbled with brown. It likes to rest in crevices of the bark, too, and eventually pupates between the leaves in a silken cocoon. It is quite easy to rear in captivity, and if you rear a number of them you can in August and September and even in October have your reward by watching the beautiful Brides emerge from their silken cocoons.

They do not remain in the pupal stage long; they are eager to leave their earthbound form and flash their velvety pinions though for a short season, much as a bride walks for a brief time in the shimmering glory of her wedding gown, and then it is put away.

Joy O. I. Spoczynska (751).

A VARIETY OF *LEUCOZONA LUCORUM* LINN. (DIPTERA, SYRPHIDAE)

Members may be interested to hear about a peculiar variation of a hover-fly, *Leucozona lucorum* Linn. that I have found.

The typical form has a yellow or orange marking at the base of its abdomen, and a brown marking down the middle of each wing. In the variations that I found, the basal abdominal marking was pure white, and this was occasionally shaped differently from the typical form. The wing markings were fainter than usual and, in one specimen, non-existent. They were smallish specimens, and difficult to recognise as *L. lucorum*. I have only found this variation at two places near Lancaster, and have not heard of, or seen, any other similar specimens. Have any other AES members come across this variation, or is it possibly just a local one, confined to the Lancaster district?

R. Underwood (2338*).

THE CAMBERWELL BEAUTY (*NYMPHALIS ANTIOPA* LINN.), IN CO. DURHAM

Members may be interested to know that I saw a specimen of a Camberwell Beauty butterfly (*Nymphalis antiopa*) at Murton, Co. Durham, on 14th September 1954.

It was about noon, and in bright sunshine. I had a close-up view for some five minutes on end, while it fed on the juice from some apple peelings recently thrown on a compost heap, the butterfly slowly opening and closing its wings much of the time.

I have not seen one in this district before.

N. L. Suffield (1157).

A LEPIDOPTERIST'S NOTES 1953-1954

The past two seasons have afforded me very few exciting captures, but I append the following notes in the hope that they may be of interest. In 1953 the best collecting I had was in a remote Somerset village during the first week of August. In one particular spot—I shall always remember it—a flowery bank sloping down to a marshy, woodland-fringed stream, *Argynnis paphia* Linn., *A. cydippe* Linn., and *A. aglaia* Linn. flaunted their many-hued wings in comparative abundance. Although the last two were somewhat worn, I took several fine *paphia*. Here, too, I took a single very battered *Limenitis camilla* Linn. (this must be its extreme western limit) and several quite good *Agapetes galathea* Linn. Among others that occurred in this spot the most striking were *Thecla quercus* Linn., *Eumenis semele* Linn., *Polygonia c-album* Linn. and *Pieris napi* Linn. The Somerset form is very striking and I saw many handsome varieties.

The moths of the district were numberless, and I took for the first time that very handsome moth *Lymantria monacha* Linn. The farmer with whom I was staying brought me a very battered *Arctia caja* Linn., very proud at having caught "one o' them big butterflies". The most striking moth that came to my light was the Drinker (*Philudoria potatoria* Linn.

Later in the month at Lewes on the South Downs I took a *Polygonia c-album* Linn., var. *hutchinsoni*, with the 'comma' joined, forming a triangular mark. Here also the small blue (*Cupido minimus* Fuessl.) was in abundance and two local collectors I met, told me that it often had a second brood there. On the 30th of August I took a perfect *Vanessa atalanta* Linn. ab. *bisecta* (Fig. 1). Most specimens of *atalanta* have a dusky stripe across the red band but few have it completely separated, so I was quite pleased with this. From then onwards I caught nothing interesting until October 11th. This was a very battered male *Pararge aegeria* Linn., taken in Epping Forest and only valuable as a specimen by reason of its being the only specimen here for 50 years or more! I have omitted above the rarest insect I saw in '53, which was a fine *Danaus plexippus* Linn. on the 1st of August in Somerset. A full report of this

Fig. 1. *V. atalanta* ab. *bisecta*

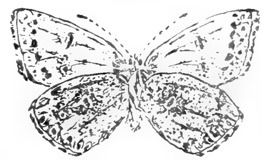


Fig. 2. *L. coridon* var. *obsoleta*

observation is given in *Ent. Rec.*, **65**, 322.

My 1954 season really started on the 7th of April when I caught a fine aberration of *Polygonia c-album* in Surrey. It is extremely dark for the species and has the central spots on the hindwings enlarged and confluent. It is in almost perfect condition and it is hard to believe it had spent four months in hibernation.

Late in July I spent a fortnight near Royston, Herts., in the hope of picking up some fine vars. of *Lysandra coridon* Poda, but the weather was unfavourable and I caught very few and nothing striking. The moths of the district, however, more than made up for the lack of these, and on one night over 50 species flew into my bedroom attracted by the light, quite apart from 'pugs' and 'micros'. Mrs. Spoczynska (751) (see *Bull. amat. Ent. Soc.*, **13**, 85) would have enjoyed this immensely, since the six commonest 'Wainscots', viz., *Leucania pallens* Linn., *Arenostola phragmitidis* Hb., *L. pudorina* Schiff., *L. straminea* Treit., *L. impura* Hb., and *Rhizedra lutosa* Hb. all occurred abundantly.

My only really striking *coridon* variety this year was a var. *obsoleta* taken at Lewes on 30th August. (See Fig. 2.)

P. E. SMART (2293*).

LETTERS TO THE EDITOR

BUTTERFLIES IN 1954

In the last week of June, I found that *Plebejus argus* Linn. was out in considerable numbers, both males and females, in spite of the adverse weather conditions. Amongst considerable variation in the undersides of the females, I was fortunate in finding an ab. *obsoleta*.

In the same locality, on the 14th August, I saw six *Argynnis euphrosyne* Linn., five in perfect condition, the other with a tear in the wing. It is not unusual to see one example of a second brood, but I should think that six is the record for the wet and stormy summer that we have just experienced.

W. Gerald Tremewan (940).

A RECORD SWALLOWTAIL?

From most of the literature I have seen, it appears that the maximum size ever attained by *Papilio machaon* Linn., ssp. *britannicus* is $3\frac{3}{4}''$, but I have a Norfolk Broads specimen exactly 4" in expanse. Is this a record?

P. E. Smart (2293*).

CONSERVATION OF RARITIES

Whilst on holiday in Hastings I heard, from two sources, of a rare larva being found on toadflax at Dungeness. I thought it might be the Toadflax Brocade, *Calophasia lunula* Hufn., and this was confirmed on visiting the area. From the top of the lighthouse I could see a collector rooting up toadflax and in a subsequent trip over the shingle, to enjoy the unique flora there, found many handfuls of discarded toadflax plants, and was also fortunate in seeing a larva which my daughter found. As the moth is so rare in the country as not to be included either in South, or in the AES label list, I found this lack of security rather perturbing. Imagine my surprise, therefore, to find, on my return home, a full account of its being found, and even encouragement to go and collect it, in the columns of AES Bulletin. (*Bull. amat. Ent. Soc.*, **13**, 81). I have no doubt that Mr. Aldridge (262) was acting in good faith when he gave such accurate information, but I feel that we all ought to bear in mind the important need of conservation of our rarities before making available such information to all—serious workers and unscrupulous collectors alike—in a widely distributed publication.

C. D. Bingham (1506).

I always enjoy the practical hints in the *Bulletin*, but one point in September's edition I think needs a little comment. This is the suggestion that members might dash off to Dungeness and collect larvae of *Calophasia lunula* Hufn. Surely it is not within the keeping of the general aims of the society in suggesting that large numbers of people should collect *lunula* in one small area like Dungeness, which would most probably result in this newly-acquired breeding species being wiped out from that part of the country. Would not it have been better to suggest searching Toadflax in one's usual collecting areas for *Eupithecia linariata* Fabr. and at the same time keep a look out for *lunula*, with the idea to see if it has extended its range still further?

To go back to Dungeness, a large area of the shingle beach where the Toadflax is very much in evidence, is rented by the Dungeness Bird Observatory Committee and it is very disconcerting to ornithologists there, when after driving birds over a large area, they find a couple of entomologists in the mouth of their bird trap.

Accommodation and cooking facilities can be had at the Observatory, and I therefore suggest that anybody contemplating a trip to Dungeness should write to the Secretary of the D.B.O. (Mr. H. A. R. Cawkell, 6 Canute Road, Hastings) beforehand, as anybody interested in any branch of natural history is most welcome at the observatory. The only duty asked is to write one's observations in the log book before leaving, and so add to the accumulating knowledge of this most interesting corner of England.

E. G. Philp (2165).

[We are sure Mr. Aldridge would be the first to condemn the unscrupulous collector; in fact, he particularly urges restraint in the collecting of the Adonis Blue (*Bull. amat. Ent. Soc.*, **13**, 79).—Ed.].

Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. 1954.

VOL. 13

No. 168

EMBER - - 1954

THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

EDITED by B. R. STALLWOOD

AES
BULLETIN
No. 168
DECEMBER 1954

EDITORIAL

After having completed his first year of editing the *Bulletin*, the Editor would like to express his thanks to those members who have contributed articles and observations.

He is also much indebted to the proof-readers, Messrs. W. J. B. Crotch (1181), H. K. Airy Shaw (525), and T. R. E. Southwood (1051), who, in addition to this task, have offered assistance in many ways.

Gratitude is also extended to Mr. W. H. T. Tams who has kindly advised on the nomenclature of exotic species, and to Mr. A. Blackburn (1715), for his patient work on the *Bulletin* Index.

•

AN EGG PARASITE

By the gift of a friend I received last summer some ova of a Saturniid moth, *Hylesia nigricans* Berg, which is a pest of willows around Buenos Aires. The eggs are laid in little mounds about 10 mm. in diameter and 5 mm. high. They are embedded in what looks like fine grey felt and covered over with brown fibres which might have been shed from a doll's doormat, but are doubtless "hairs" from the maternal abdomen. The egg is straw-coloured to begin with, but turns steel grey as the larva within grows ready to emerge. It is the shape of a hen's egg, about half a millimetre across and perhaps three-quarters long.

On 9th September the egg mound was covered with minute straw-coloured caterpillars having shiny black heads and, running about over the top and around the circumference, were a dozen or so equally small black Hymenoptera. They were disinclined to fly and it was not too difficult to pick them up with a moistened No. 0 watercolour brush and bed them down into a trace of Canada balsam where they were killed by a drop of Xylol to make temporary microslides. (One was shown at the AES Exhibition.) Their minuteness can be judged by the millimetre scale in the accompanying figure, which shows both sexes and was drawn by projection.

Mr. G. E. J. Nixon of the British Museum (Natural History) kindly identified them for me as being within the genus *Telenomus* of the family Sceleonidae (superfamily PROCTOTRUPOIDEA). The female parasite lays her own egg in the moth's egg, from which it sallies forth as a winged insect, having completed its life cycle in the same period as the moth's larva takes to hatch. No one knows how the parasite makes its living. It does not seem possible that the parasite should be specific to its Saturniid host, which, I understand, is only single brooded. It is possible that it attacks the eggs of other moths with different laying months. Unfortunately, I had no alternative newly-laid ova to offer.

The *H. nigricans* larvae took to privet but did not survive their first moult.

W. J. B. CROTCH (1181).

Telenomus egg-parasites

MOTH MIGRATIONS TO THE BRITISH ISLES

HERSE CONVOLVULI Linn.
MACROGLOSSUM STELLATARUM Linn.
PLUSIA GAMMA Linn.

Of the 2,360 Lepidoptera now listed as British in I. R. P. Heslop's Check-list published in 1952, only 16 butterflies and 22 moths are sufficiently well known as immigrants to the British Isles, which the Insect Immigration Committee of the South-Eastern Union of Scientific Societies now schedule for daily record. Amongst these, there are ten species regarded as seasonal immigrants, which cannot normally maintain themselves in our winter climate. By day we observe the Painted Lady, Red Admiral and Clouded Yellow butterflies, and by night, with the aid of mercury-vapour moth traps, the three most important moths for observation, the Convolvulus Hawk, the Humming-bird Hawk and the common Silver Y moth, are due for special study. The migrations of the Silver Y Moth and its activities have been studied in detail. (K. Fisher, 1938, and Elinor Bro Larsen, 1949). We now require studies of the Convolvulus Hawk-moth upon a similar scale, and, to explain what is already known of the different habits of the three species, special attention will be devoted to present records of the most puzzling details reported of the Humming-bird Hawk-moth, *Macroglossum stellatarum* Linn., which ranges from the Canaries to Japan in temperate climates, but is not found in America.

From the records kept by an average of some 300 observers in the British Isles between 1930 and 1953, the average annual abundances recorded amount to 103 Convolvulus Hawk-moths, 605 Humming-bird Hawk-moths, to nearly 20,000 Silver Y moths; but the figures are very variable and show no consistent correlation, save that the Convolvulus is always the latest to appear and generally years of scarce immigration seem to coincide with minimum Sun-spot periods. In wing expanse the Convolvulus is the largest, at 94 to 120 mm. to the Humming-bird's 50 to 58 mm., and the Silver Y only 40 to 46 mm., and often dwarfed in the autumn swarms. The Convolvulus only feeds on the wing at flowers for a short period at dawn and dusk; by day it rests blind and helpless; whereas the Humming-bird and Silver Y feed on the wing at flowers by day, and all three species migrate by night.

The large swarms of Silver Y moths which invaded Denmark in 1946 were studied by Elinor Larsen, who found that they were most active in temperatures between 77° and 86° F., but much reduced below 64° F., and that the moths were much more sensitive to temperature changes than to light and darkness. This would mean that in England it likes to feed in warm sun by day, but at dusk as the earth cools it will rise to warmer air above and a wind movement may be the initial cause of the direction of migration, perhaps in swarms of myriads, as seen at the lanterns of our lighthouses in summer occasionally, since 1934. We have only one similar occurrence recorded for the Humming-bird Hawk-moth: on July 27th, 1951, a close swarm of *M. stellatarum* appeared around the lantern of the Eddystone Light (oil) at night 133 ft. above sea level, and some dozens got burnt (T. Dannreuther, 1952). The Convolvulus Hawk-moth is usually seen singly, but on August 26th, 1944, at St. Leonards-on-Sea, at least a hundred were seen circling a search-light beam all night and some picked up exhausted at dawn. The Silver Y moth is attracted to search-lights or mercury-vapour lighted traps, sometimes in swarms of thousands; the Convolvulus Hawk-moths also appear singly in M.V. traps but not the Humming-bird Hawk-moth—the reason for the latter shunning mercury-vapour but not oil lamps is a mystery needing investigation.

The operation of mercury-vapour traps in winter here, shows that all three species are lethargic and inactive at temperatures below 40/45° F., though occasionally a few specimens in one stage or another may survive an English winter, and reports of this are commonest for the Humming-bird Hawk-moth—in the mild winter of 1950 a dozen were recorded hibernating between Cornwall and Sussex, sometimes indoors. On the Riviera coast, where *M. stellatarum* is absent from April to mid-August, i.e., when plentiful in England, hibernators become active in sun or warmed rooms in winter: e.g., at Cavalaire (Var) on Christmas Day, 1947, one appeared at a bowl of cut geraniums on the dinner-table (Lt.-Col. N. Eliot, 1953); but in England during the last 18 years, only odd specimens have been seen flying as a rule before the June immigration.

In the south of Europe "there would seem to be at least two distinct broods, one appearing in June and the other in October . . . the period from egg to

moth is known to be less than two months'' (R. South, 1948); but there are no records of October migration. To the north it ranged to the Shetlands on June 7th, 1947, and in the south in 1894, Mrs. Holt White reported "its appearing from March to September but in greatest numbers in June in Teneriffe"; but it was not until June 7th, 1923, that it was recorded migrating from Africa —eleven captured in a steamer 58 miles off Oran, at 10 p.m., 65° F.

In 1934 A. Magnan calculated *M. stellatarum's* speed of flight at 11·1 miles per hour at 85 wing-beats per second, compared with 12 for *P. brassicae*; though according to Snodgrass, some Hawk-moths attain 28 miles an hour, or 15 metres per second, and Marey gives the White butterfly 9 strokes per second to 72 for the Humming-bird Hawk-moth and a house fly up to 330! (M. Burr, 1954). At any rate, the speed of advance is so great that with binoculars it is impossible to see their approach to our shores on arrival. When feeding at flowers, the wing beats are too fast to be seen as it hovers with outstretched tongue. It displays great agility apparently assisted by expansible anal and lateral tufts used whilst hovering, but has no halteres like the flies, and the hind wings are small. The *Macroglossum* species are most numerous in the Indian region, but we have only the type of the genus, *stellatarum*, and the ways in which it differs from other species are due for detailed study. It is, therefore, worthwhile to set out certain extracts from the records printed annually in *The Entomologist* to show its peculiarities.

Immigration of Macroglossum stellatarum to British Isles

In 1932, when systematic observation was organised in England, only 6 *M. stellatarum* and 5 *H. convolvuli* were recorded in the British Isles. The next lowest figures were in 1940, with 55 *stellatarum* to only one *convolvuli*. Yet in 1933 there were 572 *stellatarum* to 180 *convolvuli*, and in both that year and 1940 *P. gamma* stood at the low total of 500, compared with 30,000 in 1935 and 1936, and rose to 300,000 in 1946.

In 1934 *M. stellatarum* was first reported indoors at Plymouth on February 14th, and the season extended to November 12th at Eastbourne, after it had ranged to Unst in North Shetland. An odd observation came from the Round Island Lighthouse in the Scillies, which has a powerful red light. Here dozens were seen in flight to the north on June 7th. It is surmised that the red flashes were attractive. The total for 1934 was 594, but only 181 in 1935. At St. Mary's in the Scillies F. W. Frohawk found specimens very numerous at flowers after gales in mid-September, 1935. Though scarce in autumn, half-a-dozen were recorded that winter. A feature of the 156 recorded in 1936 was a report by J. R. Le B. Tomlin of hundreds over Red Valerian flowers in his garden at dusk on June 24th, then considered a rare event implying a close swarm feeding together.

After this the records show general scarcity up to 1943 when the annual total recorded was 870, and this was the year of unprecedented Striped Hawk-moth immigration of 543 plus 93 bred. There is no positive correlation between *stellatarum* and *livornica* and the extraordinary abundance of the latter has been attributed to drought, leaving only the watered vines in the Madrid provinces available as a food plant, perhaps causing an extension of range.

In June, 1944, the invasion of Normandy provided our soldiers crossing from England in landing craft, with an opportunity for recording a northern flight of independent *stellatarum* visiting the boats at sea on several afternoons between the Isle of Wight and Caen; but no extra abundance was noted in England as a consequence. It should be noted that they flew only a few feet above sea level in crossing.

In 1945, another year of Continental drought, the abundance rose to 2218. In August dozens appeared at Paignton, and early in September L. H. Williams reported "several hundreds, very fresh, and captured some dozens at Newquay, Cornwall". There must have been some overlapping as a few overwintered and there was an emergence at Barton-on-Humber on March 25 next spring.

In 1946 abundance dropped back to 950 but in July the species ranged up to Yell in Shetland and in Sussex "a hundred were seen in a mile ride in Vert Wood near East Hoathly".

The years of exceptional droughts in North Africa and on the Continent, 1945-1947, coincided with unprecedented invasions in the British Isles of 5179 *M. stellatarum* in 1947, of 300,000 *P. gamma* in 1946, and of high abundance records for all the regular immigrant species, without exception, in the year 1947—a record year generally. It was the same in Holland where records by 120 observers have been kept since 1940, and recorded 2037 in 1947 as the

best year for *M. stellatarum*. There is little doubt that the drying up of the principal food-plant, the Bedstraw (*Galium verum*) in the south extended the northern range.

In June 1947 at Cliff End, 4 miles east of Hastings, A. Denby Wilkinson observed the arrival of Humming-bird Hawk-moths all day averaging 30 per hour. They could only be seen landing upon the cliff face, there about 100 ft. high, at the level of 75 ft., but they did not loop over the top, turning instead to east or west in even numbers. This is unlike the migrating habit of White butterflies, which would maintain their flight direction by looping over the top, and this difference in habit is a probable cause of dispersion by day, as they always arrived independently and the focal point of arrival was only found by moving along the cliff face until even numbers went east and west. Arrivals from somewhere near Cap Grisnez or Boulogne, the latter being 35 sea miles to the E.S.E., and Dieppe 60 miles South, began an hour after dawn, and lasted until an hour before sunset. The migration continued for some days upon a smaller scale as long as the warm sun continued (A. Denby Wilkinson, 1948). Although one was recorded at St. Ives as early as April 16th, the species did not appear near Hastings until June 1st, and it got to Scalloway in Shetland by June 9th, and as late as October 12th, in the early morning, a dozen arrived at the Owers Light Vessel off Selsey. In the west about 200 were seen at St. Mawes in Cornwall, and in October it was estimated that at Ilfracombe, the Curator saw "scores at a time, a thousand in the aggregate" and at many places up to Hunstanton and Lundy Island, dozens were recorded. It certainly remained active up to Christmas that season.

Thus 1947 appears as the climax *stellatarum* year, at 5179 recorded, and only comparable with 2218 in 1945, and 1078 in 1899, since 1827 when the Rothamsted records first recorded the migrant species. With half the number of observers in Holland, 1947 also recorded its maximum at 2037, to 365 in 1945, with an eleven year average of 350. Remembering that the average abundance recorded annually in the British Isles recently (1930-1953) is 605 *stellatarum*, the last five years show nothing exceptional: the recorded abundances were 429 in 1948, 845 in 1949, 719 in 1950, 132 in 1951, 461 in 1952 and only 90 in 1953. On July 8th, 1950, at Cliffend, Hastings, 116 were counted coming in across the Channel, followed by 42 next day. In that season Holland recorded a normal 355.

The most notable event in 1951 was the appearance of a close swarm already referred to at the Eddystone Lighthouse on July 27th, otherwise a year of scarcity. 1952 was an average year but one Continental observation is worth recording. At the end of May at Weinfelden, in North Switzerland, A. Welti caught a pair of *stellatarum* coupled on the wing. This shows that pairing takes place after hibernation, and in the Spring migration, as in the case with *V. cardui* in England. It is a characteristic of migrant butterflies that they start their flights when sexually immature, and challenge for mates later. Up to June 30th in 1954 only 30 *stellatarum* had been recorded. The first was recorded in the Basses Pyrénées on March 18th, and the first at Plymouth on March 24th. On June 13th one was taken in the Royal Sovereign Light Vessel off Bexhill in early morning; but these isolated specimens merely indicate a year of scarcity like 1953.

These details give all the facts observed in the British Isles, regarded as the end point of the northerly migration of the North African and Mediterranean migrant species of moths worth studying.

Some special problems

Whether it is mere coincidence or climatic effects, perhaps due in origin to the not very consistent 11-year Sun-spot periods, it is worth recording that the years of Sun-spot minima 1931-2, 1941-2, and now 1953-4 are paralleled by the years of scarce immigration recorded in the British Isles for the three principal migrant moths *Plusia gamma* 1930-2, 1940, 1954; *Herse convolvuli* 1931-2, 1940-1, 1954; and for *Macroglossum stellatarum* more precisely in 1930-2, 1939-42, 1953-4. Future decades will decide if correlation is real.

We have concentrated on recording the arrival and dispersal of immigrant moths, but little attention has been paid to their departure, either by emigration or mortality in winter cold. We had recorded that the Curator of Ilfracombe Museum in October 1947 reported "a score at a time, thousands in the aggregate", yet we have no knowledge of what became of them later. This is the kind of observation that requires following up by local lepidopterists. If not a complete migratory exodus, what causes the absence of any record of

stellatarum in the Riviera from April to mid-August? or in Teneriffe from October to February? Is hibernation inferred in a climate with equable temperature all the year round?

Why do *P. gamma* swarms enter mercury-vapour light traps so readily and *M. stellatarum* avoid them? Both are day feeders in the Sun, and both migrate at night in swarms, but only *stellatarum* migrates northwards across the Channel by day. Vision would appear to be similar in character for both *gamma* and *stellatarum*, but not for *H. convolvuli* as the latter is blind by day. The wavelengths of light down into the ultra violet far exceed human sight, so the range of vision must be larger in the day-feeding moths, but to what extent needs investigation. Are moths red-blind like the bees?

It has been shown that the height of migratory flights over sea varies from 2 to at least 133 ft., but information as to speed of flight varies from 11 to 28 miles per hour. Further experiments are overdue to determine average speed and endurance for long migrations without feeding. Why does *stellatarum* not follow the butterflies' habit of looping up and over obstacles met on migration? Does this mean a permanent change of flight direction, or random dispersal? More records are required to trace routes taken after arriving on our coasts. What causes swarms to assemble before a night flight and what determines the direction of flight, other than the avoidance of intemperate climate or absence of flowers? All our immigrant moths come to us from the South and here we study their habits as an end point of their northern migrations. In Holland, Switzerland and France other organisations report their transmigrations; but we lack information as to the areas of origin of these species, and the circumstances which induce emigration from them. Is it climatic in the heat of summer north of the African deserts? Is it due to drying up of food-plants and, if so, which and when? Is overpopulation a cause, as suspected of dragonflies in ponds? An expedition in 1953 traced migration routs in the Pyrénées passes and similar work is required in Sicily, Corsica and Italy to trace eastern routes to the north from Libya and Algeria or Egypt. For comparison we also want to record habits of the same species in China and Japan.

T. DANNREUTHER (60).

REFERENCES

Burr, M., 1954. *The Insect Legion.*

Dannreuther, T., 1952. Migration Records. *Entomologist* **85**, 128.

Eliot, N., 1953. Overwintering of Migrant Lepidoptera on the Côte d'Azur. *Entomologist*, **86**, 124.

Fisher, K., 1938. *Journal of Anim. Ecol.*, **7**, 2, 230-247.

Larsen, Elinor Bro. 1949. *Kgl. Danske Videnskabernes Selskab*, **21**, 4.

South, R., 1948. *Moths of the British Isles*, **1**, 52.

Wilkinson, A. Denby, 1948. *Hastings and E. Sussex Naturalist*, **7**, No. 3, 88-92.

[The Secretary of the Insect Immigration Committee is Mr. R. A. French, Dept. of Entomology, Rothamsted Experimental Station, Harpenden, Herts., to whom all records should be sent.—Ed.]

REVIEW

Atlas Geográfico de la República Argentina. 1945, Ediciones Peuser, Buenos Aires. 31 pp. + xxiii. 15″ × 11″. Price 30s., payable in Great Britain.

This excellent atlas is of interest to any student or breeder of South American insects who wishes to know more of the geography of their country of origin. The atlas includes ten general maps, among them those showing the relief, rainfall, natural regions and geology of Argentina, and then follow separate maps of each of the country's provinces and territories. Contours are shown by distinctive colours, and numerous place names are given, so that it should be possible to trace all but the most obscure localities. About 5000 of the names are indexed. Incidentally, the Falkland Islands appear unfamiliarly as the Islas Malvinas, and these and disputed areas of Antarctica are uncompromisingly shown as Argentinian territory. The atlas may be obtained on enquiry from our member Sr. F. H. Walz (2139).

E. L.

Dr. H. B. D. KETTLEWELL

Dr. KETTLEWELL will not be returning to Africa this year as he expects to be permanently in this country, and his address will be:—Genetics Laboratory, Department of Zoology, Parks Road, Oxford.

LETTERS TO THE EDITOR

MR. PHILIP M. MILES' "SUGARING TRAP"

Under the heading "A trap designed to collect insects attracted by 'sugar'" (*Ent. mon. Mag.*, **90**, 86), I read to the limit of my credulity of God's gift to enthusiastic entomologists, an automatic "sugaring trap". No longer shall I have to "trudge the weary dawn"—how I envy Mr. Miles and his nights of blissful sleep. Furthermore, I can now "sugar" two or more places in different parts of England on the same night—and sleep. Are we having our legs pulled. Mr. Editor, or has panacea arrived at last? I hurried through the text on nuts and bolts, cellulose acetate sheeting and suspended tree trunks, but lists of captures were there none. Does Mr. Miles suggest that sophisticated Lepidoptera, under the influence of the proximity of alcohol and molasses, really lose their heads and like automatons at light, dive into his trap? Well, suppose I am wrong, and, in fact, they do: so what? I implore Mr. Miles, if he is able to extract (and identify) from the inevitable morasses (or molasses) in his killing bottles, where all good insects finish beneath his traps, to give us lists, so that I for one, may have more sleepful nights.

Whilst not wishing to steal the thunder of this shattering invention, I must put on record the fact that in 1920 I also designed two types of sugaring traps. The incentive was slightly different—schoolboys go to bed when moths come out. For two whole years I had hung out of my dormitory window waving a six foot pole with net attached—and so Mother Necessity gave birth to my inventions:—

TRAP NO. 1. "THE KETTLEWELL 'BASH AND RUN' SUGARING TRAP".

The principal is simple:—a rough board, which was sugared, ran in grooves into a closed wooden box. The board was attached to thirty feet of string beneath my window and had a flange at each end. At regular half-hour intervals throughout the night the board was dropped into its container, the insects present being rudely precipitated into the box. The board was then drawn up again. The whole trap was hauled up in through my cubicle window at daybreak.

ADVANTAGES.—I caught moths—fine series of *T. pronuba* and *A. monoglypha*.

DISADVANTAGES (To Mr. Miles' trap). —(1) I sat up all night. (2) It made a noise every half hour.

CONCLUSION.—It took the housemaster two weeks to discover where the noise came from. Trap confiscated. Beaten.

TRAP NO. 2.—Similar in many ways to Mr. Miles' miracle trap (if he turns his upside-down). Instead of the sugared tree trunk it had a central perforated zinc core with sugaring mixture container at bottom, heated by a methylated spirit burner. The smell was delicious. The trap hung in a tree.

ADVANTAGES.—Any specimens foolish enough to enter were kept separate from the sugaring mixture.

DISADVANTAGES.—After three weeks the whole apparatus caught fire. Tree burnt out. Beaten.

Thus were two revolutionary prototypes lost to science.

I give below (unlike Mr Miles) a complete list of insects caught in No. 2 trap, though I suspect my results may be similar to his.

Lepidoptera 0, *Coleoptera* 0. *Hemiptera* 0, *Dermaptera* 4—*Forficula auricularia*.

I hope others, Mr. Editor, will be stimulated to contribute to our knowledge of the little known practice of sugaring traps.

H. B. D. KETTLEWELL (706).

P.S. The 4 *auricularia* were found to be regular inhabitants of the container and in no way connected with the attractions of the trap.

A NEW COLLECTING METHOD.

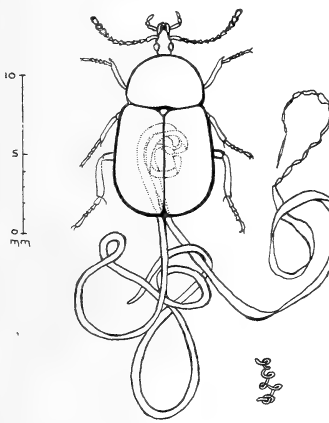
While on holiday in Austria in 1954, my wife was sitting reading while I explored for Lepidoptera. On my return, she said she had a butterfly in her handbag. It had settled on her frock, had been transferred to an envelope and thence to the bag. It was a Purple Emperor in excellent condition. This seems a much easier method than using a net on a 20 foot pole as described by South. But, of course, white nylon was not known to the Purple Emperors of South's day.

L. W. SIGGS (243)

A BEETLE PARASITE

During a stay in Oban, Argyllshire, from 30th May to 7th June 1954, Mr. W. J. B. Crotch (1181)

collected a number of beetles, some of which he kindly gave to me. Among them was a specimen of *Phosphuga atrata* Linn. (Silphidae) which presented a curious appearance. When killing it (with "Thawpit") Mr. Crotch had been much intrigued to see two long, thin, contorted objects, resembling excreta, emerge from the anus and remain attached to it. They were, in fact, two worms which had been parasites within the beetle. Part of the bodies of each of them remained coiled within the abdomen, as shown in the accompanying figure. Unfortunately it is not possible to show the worms in relation to the internal organs, as these were unrecognizable by the time the beetle was examined.



Phosphuga atrata infested by *Parachordodes violaceus*

The worms were kindly identified by Mr. William G. Inglis of the British Museum (Natural History) as the Gordiid, *Parachordodes violaceus* (Baird, 1853) (Phylum NEMATOMORPHA, Hairworms). In correspondence, Mr. Inglis gave the following information on the life-cycle, which he allows me to quote:

"The adults live in fresh water, lay the eggs in the water, a larva develops and escapes from the egg and enters an insect. The larva . . . is equipped with a proboscis provided with spines and, although the manner of entry into the host has never been observed, it is generally considered probable that the larva enters its insect host by boring through the body wall. It has, however, been claimed by some workers on other species that the host can be infected by eating the larva or an encysted form of the larva.

"The larva occupies the pseudocoel of its host and may develop to maturity in several weeks, but may take months. The worm then works its way out of the host and goes back into the water and the life-cycle starts over again.

"It is most probable that the insects become infected when adult and not during their larval stages, although, again, this is a possibility".

Phosphuga atrata is a common beetle, usually found under the bark of logs, under stones, or among grass roots; it is believed to feed mainly on small molluscs.

Interested members may like to look up a paper written by Miss D. J. Jackson (1124) on Nematodes infesting water beetles (*Ent. mon. Mag.*, **87**: 265-8), which contains a number of useful references. (Gordiids resemble Nematodes, but are now placed in a separate Phylum.) It is evident that knowledge of these insect-infesting worms is far from complete, and any observations of their occurrence and habits, with identification of the hosts, would be of value.

E. LEWIS (952).

NEW ZEALAND STICK INSECT IN DEVON

I should like to suggest a possible means whereby the New Zealand Stick Insect (*Bull. amat. Ent. Soc.*, **12**, 92-4) could have reached the Scilly Isles. It is quite possible that a single *parthenogenetic* female could start a whole colony of these insects, so that *numbers* do not really enter into the problem. Also, Stick Insects as a group are noted for their longevity, and are moderately cryptic in form. It would be quite easy, therefore, for an adult female to have been brought to the Scilly Isles with the New Zealand plants, and even for the Paignton colony to have been started in a similar manner by one of her offspring.

As the members of both colonies would be nearly, or quite, all females, able to produce parthenogenetic female offspring, their numbers would increase as a geometrical progression, especially in the absence of natural enemies. Available food and adverse weather conditions would therefore be the controlling factors.

PETER G. TAYLOR (719).

MICRO-LEPIDOPTERISTS GROUP

I am proposing to form a Micro-lepidopterists' Group, to enable those members of the AES who are interested in the 'micros' to keep in touch with one another, to help the beginner, and to encourage others to take up the study of these moths.

It is intended to organise a "Circular Bulletin", though here a member with a little spare time and a typewriter could help a great deal.

Would all members interested in joining this group please write to me, mentioning their special interests, if any; and, if possible, include a contribution for the first Circular Bulletin?

D. OLLEVANT (1514), Gen. Sec.

PRACTICAL HINTS — DECEMBER

The year is drawing to a close, and little field work remains to be done as far as macro-lepidoptera are concerned.

When the weather is dry, pupa-digging may be carried out to some advantage. Do not expect rapid results or large numbers; as the winter months pass the number of pupae to be found diminishes, due to the work of mice, moles, birds, etc.; nevertheless, if time is available and the weather favourable, pupa-hunting can add considerably to the collection.

Searching hedges by torchlight after dark will reveal a few moths such as *Erannis aurantiaria* Esp. (Scarce Umber), *Operophtera brumata* Linn. (Winter Moth) and *Erannis defoliaria* Clerck (Mottled Umber). The females of these species, being wingless, require keen eyes and some patience to locate them. Light will attract males of the above species, together with *Poecilocampa populi* Linn. (December Moth). In some areas this latter species is very common, males coming to the lamp by the dozen. Mercury-Vapour lamps seem to attract females in fair numbers.

During the winter months, when outdoor work is at a minimum, prepare for the coming season by making cages for larvae, beating trays, sweepnets, etc. (see *AES Journal*, Vol. 9. *Practical Methods and Hints for Lepidopterists*). Setting boards should be repapered where necessary. Fine sandpaper removes the old paper better than soaking in water, since this method is liable to warp the wooden base. Use only paste, NOT glue, for repapering. For those who prefer guide lines across their boards to assist in getting the wings of their captures at the same height, these may be carefully drawn with the aid of a set square of the type used by carpenters.

A useful accessory which can easily be made is a pin holder. This is simply a sheet of cork about 12″ × 6″ glued to a piece of fairly heavy wood of the same size. On this arrange plenty of Lill pins, various sizes of card braces on pins, and a supply of thin entomological pins for cross-pinning bodies, etc. With this in front of you when setting, it is a simple matter to select pins to hold the setting strips, a suitably-sized card brace for the body, etc. Then, as specimens are removed from the setting boards, the pins are replaced on to your sheet of cork ready for next time. Much better than having to select them from a tin.

All storeboxes and cabinet drawers should be checked for mould and mites. Camphor cells filled with either naphthalene or paradichlorbenzine (P.D.B.), will prevent attack by pests, whilst mould is more difficult to prevent. Unless you can arrange for storage in a very, very dry room it can occur occasionally in the best of cabinets. Painting the affected specimen with glacial carbolic acid melted by standing the bottle in hot water, or dissolved in surgical spirit, will check the trouble, but specimens thus treated always look poor. A piece of cotton wool twisted round the head of a pin may be dipped in the molten carbolic acid, allowed to cool for a few seconds, then placed in the corner or the storebox. This will prevent further attacts from mould. Carbolic acid crystals may be purchased from any chemist for a few coppers. Always take with you a small wide-mouthed bottle when buying this chemical, because it absorbs water rapidly and will become rather messy in your pocket on the way home if carried in the small paper packets which the chemist supplies! A further word of warning; avoid contact with the skin, by using tweezers to handle pins carrying the soaked cotton wool.

A Merry Christmas and a Happy New Year to you all.

R. V. ALDRIDGE (262).

Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. 1954.

A Glossary for the Young Lepidopterist	-	6d
Label List of British Macro-Lepidoptera	-	1s 0d
Check List of British Macro-Lepidoptera	-	3d

AES Leaflets

No 1.	Collecting Coleoptera		3d
3.	Rearing Silkworms		3d
4.	Collecting Sawflies		6d
5.	Collecting Flies (Diptera)	2s	6d
6.	Collecting Beetles associated with Stored Food Products	1s	6d
7.	Some Improved Devices for Rearing Hymenoptera		6d
8.	Collecting Ants		6d
9.	Collecting Caddises	1s	0d
10.	Experiments with Bees		6d
11.	Collecting Mosquitoes		6d
12.	Collecting Dragonflies		6d
15.	Collecting Heteroptera		6d
16.	Making a Sweepnet		3d
18.	Collecting Clearwings		6d
20.	Preserving Caterpillars	1s	0d
21.	Collecting Psocoptera		6d
22.	Collecting Lacewings	1s	0d
23.	Collecting Centipedes and Millipedes ...		6d
24.	Entomology of Bird Pellets	1s	6d
25.	Collecting Bumble Bees	2s	0d
26.	Collecting Collembola	1s	0d

When 12 different leaflets are ordered a deduction of 10% from the total cost is allowed.

All these publications are obtainable from the Honorary Publications Secretary, C. BIGNELL PRATT, 1 WEST HAM LANE, LONDON, E.15. A remittance must accompany the order and sufficient to cover postage must be included. Postage on one leaflet is 1½, on one volume 2d.

THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

VOLUME 14
(1955)

•

Edited by
B. R. STALLWOOD

The Amateur Entomologists' Society
1 West Ham Lane, London, E15

INDEX

Compiled by A. BLACKBURN (1715

CONTRIBUTORS

SUBJECTS

INDEX OF NAMES

NEMATOMORPHA

NEMATODA

ARACHNIDA

INSECTA

ORTHOPTERA

DERMAPTERA

PLECOPTERA

EPHEMEROPTERA

ODONATA

THYSANOPTERA

HEMIPTERA

NEUROPTERA

MECOPTERA

TRICHOPTERA

LEPIDOPTERA

COLEOPTERA

HYMENOPTERA

DIPTERA

SIPHONAPTERA

MOLLUSCA

GASTEROPODA

CRUSTACEA

ISOPODA

PLANTS

PHANEROGAMS

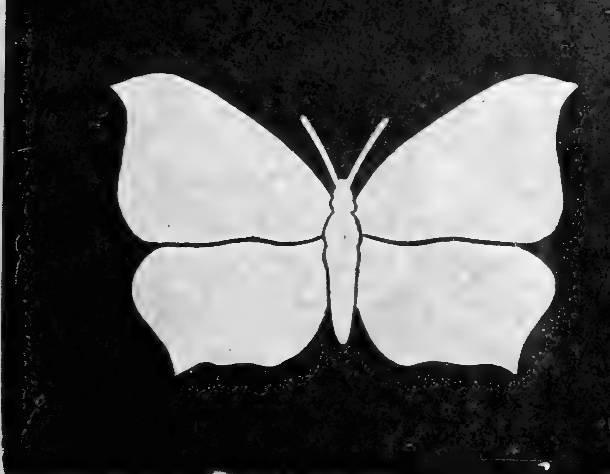
FUNGI

Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists Society, 1 West Ham Lane, London, E.15. 1955.

VOL. 14

No. 169

UARY - - 1955



THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

World List abbreviation ; *Bull. amat. Ent. Soc.*

EDITED by B. R. STALLWOOD

AES NOTICE

WHERE TO WRITE

Membership applications, offers of help to: D. OLLEVANT, *3 Salcombe Drive, Morden, Surrey.*

Advertisers to: L. W. SIGGS, *10 Repton Road, Orpington, Kent.*

Changes of address and non-arrival of Bulletins *to:* B. L. J. BYERLEY, *48 Elmgrove Road, Harrow, Middlesex.*

Offers to lead Field Meetings, exhibit, etc., to: K. H. BOBE, *19 Hengist Road, London, S.E.12.*

Manuscripts, drawings and books for review to: B. R. STALLWOOD, *19 Southfield Gardens, Strawberry Hill, Twickenham, Middx.*

Subscriptions (12/- per annum, 6/- for Juniors) to: R. W. WATSON, *15 Halstead Road, Bitterne, Southampton.*

Youth matters to: S. M. HANSON, *167 Gunnersbury Park, London, W.5.*

AES

Members can help the Society in several ways:—

(a) By dealing with advertisers and mentioning the *Bulletin.*

(b) By bringing in new members. (Subscription, 12/- per annum. Juniors, 6/- per annum.)

(c) By buying AES publications and suggesting Public Libraries should buy them.

(d) By friendly co-operation with other members.

(e) By taking just that extra bit of trouble required to record happenings of note for the *Bulletin.*

AES BULLETIN

No. 169

JANUARY 1955

REPORT OF THE ANNUAL EXHIBITION, 1954

The organisers of the 1954 AES Exhibition held on 25th September must have been highly gratified at the enthusiastic throng that filled the hall the afternoon through. Looking back over many years, I am certain I have never seen more. As was to be expected, the large number of lepidopterists among our ranks, reinforced of latter years by the growing band of Silk Moth specialists, made this the largest section, but it was most encouraging to see the good representation of many other Orders. The Council would like to take this opportunity of congratulating all the Exhibitors, Speakers and Demonstrators for their noteworthy efforts, and of expressing the hope that they will again assist in the future. Likewise, to say how pleasant it was to renew the acquaintance of so many old friends, and to meet new ones from many parts of the country.

Upon entering the hall, we saw the outstanding exhibit provided by Mr. L. C. Bushby (1075), Curator of Insects, Zoological Society of London. Well displayed in transparent cages were the Javan Stick Insect (*Orxines macklotti* de Haan); Red Wing grasshoppers from Swaziland; Mole Crickets from Britain, Praying Mantids from Uganda and S. Africa, Desert Locusts (*Schistocerca gregaria* Forskål) in various stages, and Desert Scorpions.

Among other exhibits, Mr. C. H. E. Wiltshire (2098) showed a collection of common indoor beetles; an unnamed member a selection of beetles taken at M.V. light at Orpington, Kent; Mr. C. M. Idle (2118) the Wood Wasp (*Urocerus gigas* Linn.); Mr. K. C. Side (2140) a large exhibit comprising drawings and specimens of Galls, leaves showing the work of the Leaf-cutting Bees (*Megachile*), the nest of a wasp, and Coleoptera from Central Wales. Mr. L. S. Whicher (1345) had assembled a comprehensive collection of Aphodiinae, a section of the Family Scarabaeidae (Dung Beetles) and Mr. G. F. Spink (1356) drawings of Coleoptera. The Dipterists were well represented by Mr. B. L. J. Byerley (788), and Mr. R. R. H. Hill (2253), who showed many specimens and drawings. Further we were especially pleased to have a most interesting case of Orthoptera (grasshoppers, etc.) sent by Mr. A. J. Slatter (131) from Papua, from whom also came an enormous Phasmid *Eurycantha horrida* shown by Mr. W. J. B. Crotch (1181).

For the Lepidopterist there was a wide selection. Exhibitors showing variation included Mr. A. J. M. Heselden (2084), Races and subspecies of British butterflies; Mr. P. E. Smart (2293), minor Vanessid variation; Mr. S. M. Hanson (320), Fritillaries from various localities; Mr. B. O. C. Gardiner (225), Mr. L. G. F. Waddington (169) and Mr. and Mrs. R. W. Watson (752), varieties of British species; and Mr. C. F. Rivers (1447), varieties of British and foreign species. Type specimens of British lepidoptera were shown by Mrs. J. O. I. Spoczynska (751); a case of brilliant Japanese butterflies by Mr. R. C. Chandless (2213); many species of larvae by Messrs. J. B. Steel (2162), D. Ollevant (1514), A. R. Woodman (2175*), and others, and all stages by Mr. R. V. Aldridge (262). A lone pioneer, Mr. D. Ollevant (1514), brought a case of Pyrales captured this year, Mr. L. W. Siggs (243) butterflies and moths taken on his Austrian holiday, Mr. P. C. le Masurier (978), Lepidoptera from the north of England, and Mr. P. J. Gent (192), many interesting species. Finally we were particularly pleased to see an example of the 'Littlewood' Pupa Cage, constructed by our President, Mr. P. C. Le Masurier.

As in previous years, three of our Study Groups were well represented. The Silk Moth Study Group occupied the entire platform with a most comprehensive display of living and set specimens of all stages of many of the Silk Moths, and allied species that have been reared in this country. Features that attracted a good deal of attention included the coloured figures of larvae shown by Mr. W. J. B. Crotch (1181) and the bright green larvae of *Automeris coresus* Boisd., which on contact gave a severe nettle-like sting. Mr. L. Gingell (2285)

pointed out two species of special interest, *Rothschildia arethusa* Walker which has just been reared for the first time, and *Epiphora atbarina* s.sp. *sudanica* Le Cerf which had just been paired for the first time in this country from cocoons sent by Mr. G. E. C. Hudson (2143). The Microscopy Group was also a centre of much interest. Four modern microscopes of varying design were available for inspection, examples of photo-micrography up to ×200 were displayed, and instructive slides were in use. The Larval Colours Group showed the most impressive charts detailing their work on *Euplexia lucipara* Linn. (Small Angle Shades) and Mr. P. G. Taylor (719) explained the significance of the results.

There were many other items of interest. A. R. Woodman (2175*) had also assembled and "written up" postage stamps from many parts of the world featuring lepidoptera in their design. Mr. C. Garrett-Jones (989) provided a self-lighting frame incorporating numerous colour photographs of flowers and insects of the Lebanon in the most fascinating detail, and through the good services of Mr. C. F. Rivers (1443) we were privileged to have a comprehensive exhibit explaining the research work on the virus disease of *Bombyx mori* Linn. (Silkworm Moth). As in previous years Experts demonstrated 'Setting techniques', Mr. L. W. Siggs (243) with Lepidoptera (including an exhibit of good and bad setting); Mr. B. L. J. Byerley (788) with Hymenoptera; and Mr. R. R. H. Hill (2253) with Diptera. Our two lecturers completed a fine day. Mr. E. E. Syms (406) spoke on 'The Eggs of Insects' illustrated by many photographs and Mr. W. R. Smith (1641) showed a large number of exceptionally fine 'colour transparencies' of all stages of many Silk Moths. The large and enthusiastic audiences showed how much these two speakers were appreciated.

Leading Natural History Dealers were present, and together with a well laid-out array of AES publications, were the focus of much interest and attention. An encouraging number of new members was enlisted, and it is hoped that the large number of queries answered will result in further new membership.

R. Hilliard (99).

Footnote:—Members who saw Mr. Smith's colour photographs will not be surprised to learn that he achieved the distinction of showing more than any other competitor at the 42nd International Exhibition of the Southampton Camera Club, and was awarded a Seal of Merit for a photograph of *Rothschildia jacobaeae* Walk. All this in competition with professionals and with exhibitors from N. and S. America, Europe and Hong Kong!—W. J. B. C.

"OTHER ORDERS" AT LIGHT

In reply to the query made in the Bulletin some time ago (*Bull. amat. Ent. Soc.*, **12**, 94) under this heading, I should like to record for the benefit of members that during the year or so when I worked under Dr. C. B. Williams at Rothamsted, I was counting, identifying, and recording the catches in all three of the light-traps then in operation, and was impressed (painfully, sometimes!) by the preponderance of "other orders" caught. This is easier to understand when I point out that on "good" nights, catches running into thousands were frequent, and into tens of thousands not unknown. Of these, by far the largest numbers were Diptera, with Hymenoptera a good second.

Less abundant catches were made of Coleoptera and Heteroptera—a few species only of each Order; Homoptera—unidentified while I was there; Trichoptera (rare) and Neuroptera—including both Chrysopidae and Hemerobiidae. I might add that this sort of catch was obtained by the use of ordinary, unaugmented, visible electric light.

Peter G. Taylor (719).

REVIEW

The Moths of London and its Surroundings, by C. G. M. de Worms. 46 pp. and map. London Natural History Society, 2s.

Those who have Dr. de Worms' "Butterflies of the London Area" will welcome this further reprint from *The London Naturalist*. It deals with the Macrolepidoptera of the area within 20 miles of St. Paul's and the present volume, which follows the Seitz classification, goes as far as the Sesiidae. The author appeals for more records. He is an AES member, as are several others who have supplied records, but there must be still others who can help. Lepidopterists are probably, as a species, most prevalent in the London area and Dr. de Worms has undertaken a most useful task in compiling this list. We look forward to the completion of the work.

L. W. S.

A STUDY OF THE INSECTS LIVING ON THE WAYFARING TREE

[This ecological study, for which Mr. Side was awarded a distinction in the University of London Examination for the Certificate of Proficiency in Natural History, deals with the various orders of insects associated with the Wayfaring Tree. The paper has been modified and adapted for publication by the author, and will be serialised over the next few months.—Ed.]

The Wayfaring Tree (*Viburnum lantana* L.)

The Wayfaring Tree is a member of the family Caprifoliaceae, to which also belong the Guelder Rose, the Elder, the various species of Honeysuckle and the Snowberry. Of these, the Guelder Rose (*Viburnum opulus* L.) is its closest ally.

It is a common plant of the Chalklands of Southern England, but becomes rarer further north. On the North Downs between the valleys of the Medway and the Darent, where this study was made, it is one of the chief constituents of the Chalk Scrub. There it is associated with Dogwood, Privet, Purging Buckthorn, Spindle, Hawthorn, Bramble, Rose, Blackthorn, Elder, Hazel and some other less frequent species. It is also commonly found as a constituent of hedgerows.

In spite of its name it is a shrub and not a tree, growing to a height of anything between five and twenty feet. During the winter it is leafless and the naked buds are protected by a close covering of woolly hairs instead of the scales which are more usual in woody plants. The twigs also are covered by these soft hairs, and twigs and buds have a mealy appearance which gives the shrub its alternative name of Mealy Guelder Rose.

The leaves expand in April. They are slightly pubescent above and densely so below. In autumn they take on a rich colouring ranging from yellow through orange and red to purple, and the shrub is bare by mid-November except for a few belated leaves which may remain on the branches until Christmas.

The Wayfaring Tree comes into bloom during the last few days of April and flowers are present for the next three or four weeks. The creamy white flowers are individually small, but each inflorescence is a dense umbel-like cyme from two to three inches in diameter, and when the shrub is in full bloom it is densely covered with blossoms. The scent is strong and can be detected from some distance.

The flowers are succeeded by bunches of fruit which are at first red but soon become black and succulent. They are the first fruits to ripen in the habitat and are very attractive as the red and black fruits are present at the same time. By the end of September only a few withered black fruits remain.

Aphids

Soon after the opening of the leaves in April some of them are seen to be distorted. The distortion takes the form of the leaf being curled over from the edge or the tip in such a way that the lower side of the leaf is inside the curl. The number of leaves attacked is not large. On one shrub which I selected as having an average infestation on April 22nd, 1952, between one and two per cent. of the leaves had curl-galls. The following year the aphids were far less common and it was difficult to find any curl-galls at all.

These curl-galls are caused by aphids of the species *Ceruraphis eriophori* Walker. Some leaves have more than one gall on them and are extremely mis-shapen if several are present (Fig. 1). Often the curled leaves have no aphids present especially when the distortion is slight, but I have not been able to determine whether this is due to the aphid having moved on or to its capture by a predator.

The aphids found at the end of April are adult wingless females, the fundatrices, which have developed from eggs laid the previous autumn. Each curl-gall usually contains one fundatrix, but occasionally two or even three may be present.

By the last week of April one-seventh of the fundatrices had produced young which were living inside the galls with their mothers, and others which I opened at that time had fully developed young inside them. The young aphids at this stage in the life-cycle are, therefore, produced viviparously and as no males are present, also parthenogenetically. Winged females are present in the colonies by the middle of May. With them are nymphs of various ages, some in the final instar showing prominent wing-buds. At this time up to forty aphids may be seen in one curl-gall.

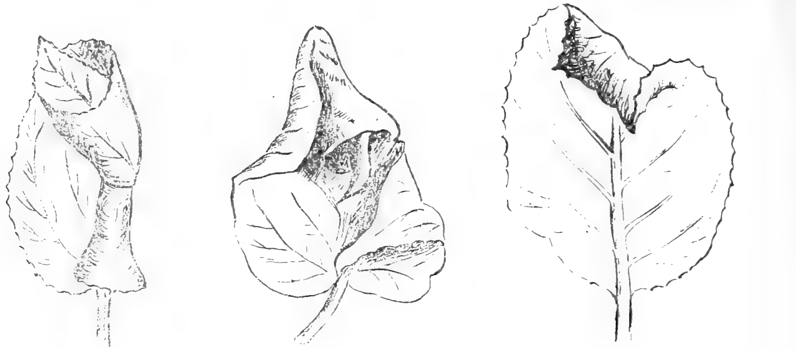


Fig. 1. Curl-galls on leaves of *Viburnum lantana* L. caused by the aphid *Ceruraphis eriophori* Walker. (Slightly reduced.)

All through May and up to the middle of June colonies of *Ceruraphis eriophori* are to be found, but after that they disappear from the Wayfaring Tree. The winged females migrate to various species of sedges and reed-mace (Cyperaceae and Typhaceae) where further generations of wingless females are produced all through the summer. In the autumn winged forms, both male and female, are produced and these migrate again to the Wayfaring Tree where the females bring forth one more brood. These are wingless females. They mate with the winged males, which are their own uncles, and, as a result, eggs are laid. This is the first and only time in the life-cycle when the male is involved or when eggs are laid. The eggs are placed on the twigs near the buds and remain there all through the winter and the aphids themselves die. The following spring, about the time that the shrub comes into leaf, the eggs hatch and give rise to the wingless females which are the cause of the curl-galls with which we began.

The life-cycle of *Ceruraphis eriophori* Walker can be represented diagrammatically thus:—

On Wayfaring Tree	*On Cyperaceae and Typhaceae*
Winter Eggs	
Fundatrices (Wingless females)	
Winged females (which migrate to sedges and reed-mace)	
	Wingless females
	do.
	do.
	Winged males and females (which migrate to Wayfaring Tree)
Wingless females (which mate with males)	
Winter eggs	

A second aphid, *Aphis lantanae* Koch, is also of frequent occurrence. It appears a little later in the spring and does not cause galls. It may be found sucking the sap from young stems, leaves or petioles. As the colonies increase in size they form clusters, the largest of which contain several hundreds of insects by mid-June. This species, like the last, was very much less common in 1953 than in 1952.

The life-history is broadly similar to that of *C. eriophori* except that as far as is known *Viburnum lantana* and *V. opulus* are the only food-plants. Migration from one shrub to another does occur and, therefore, winged forms are necessary and these are to be found during the summer. There are several

generations during the year but all seem to be females which produce young parthenogenetically and viviparously except at the end of the season when winter eggs are laid. The aphids die off leaving the eggs to carry the species through to the following year.

Insects which prey upon Aphids

Aphids are very prolific and if all the offspring of each generation were to survive their numbers would be enormous. Except for occasional plagues, however, this does not happen because the aphid population is kept in check by their numerous natural enemies. On the Wayfaring Tree the aphids are preyed upon by the larvae and adults of ladybirds and lacewings, the larvae of some hoverflies, some of the predatory bugs of the order Hemiptera-Heteroptera, some spiders and possibly some birds. They are also parasitised by certain species of parasitic Hymenoptera.

Ladybirds

Ladybirds are beetles of the family *Coccinellidae*, most of which feed as larvae and adults on aphids. During the course of this study five species were found on *V. lantana* as tabulated below.

Species.	Dates.	Notes.
Adalia decempunctata L.	April-October.	Very frequently found. Pupae taken on June 28th, 1952.
Adalia bipunctata L.	April-October.	Occasional. On foliage, or sheltering in curled leaves.
Coccinella septempunctata L.	May-November.	Very frequent in autumn. Most were found when aphids were not present.
Psyllobora 22-punctata L.	May.	One only. On blossom.
Calvia 14-guttata L.	September-October.	Two only. Both resting on foliage.
Exochomus quadripustulatus L.	June.	One only. On foliage.

The only species constantly present when aphids were feeding was *Adalia decempunctata* L. and it is surprising that I found no larvae, although I examined hundreds of aphid colonies. On June 28th, 1952, two pupae were found. One was attached to the lower side of a leaf and the other to the upper surface of one which was not fully expanded. I took them home and ladybirds emerged on July 1st and 3rd. They were both *Adalia decempunctata* L. At first they were of a pale cream colour with the elytra unspotted, while the markings on the thorax were faintly visible. The hind wings extended beyond the elytra at first. Later, these ladybirds became darker in colour but never grew as dark as the specimens taken in the field. The species is naturally variable, but these two may have been abnormal through being indoors in dull light when they emerged, or they may not have found suitable food. I had no aphids from the Wayfaring Tree available at the time, so gave them some green ones from an apple tree. They ate these readily.

Psyllobora 22-punctata L. occurred once only on the blossom and was probably a chance visitor, although it could have fed there, as I sometimes found a few aphids on the flowers.

Adalia bipunctata L. and *Coccinella septempunctata* L., the two commonest British ladybirds, both occurred throughout the spring and summer, but were most frequent at the end of summer and in autumn when aphids were not very numerous. Often they were found sheltering in the curl-galls which the aphids had left earlier in the year. In the autumn also they were sometimes found in groups of threes and fours, and at first I thought they might be preparing to hibernate but they were always in open situations which to me seemed unsuitable and I never found any after the onset of the cold weather.

Only two specimens of *Calvia 14-guttata* L. were seen, both late in the year. Their presence was probably accidental.

Exochomus quadripustulatus L. was seen only once. It was almost certainly a stray visitor as it is usually found on fir-trees.

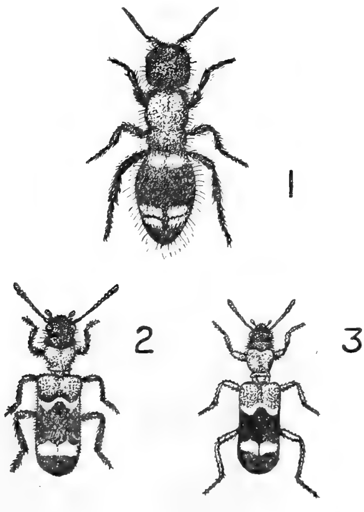
(*To be continued*)

K. C. Side (2140).

MUTILLA AND *THANASIMUS*

It may be of interest to record that on the 12th July 1954 I took a ♀ of *Mutilla europaea* Linn. (Hym., Mutillidae) at Studland, Dorset. It was found on an ants' nest of unknown identity, but in view of the habits of the insect this was no doubt accidental and not evidence of mutual association.

There were several contributions on this and related species in the *Bulletin* in 1949 and 1950 (*Bull. amat Ent. Soc.*, **8**: 68, 84; **9**: 1, 9, 21, 44), which together describe their habits fairly fully. The purpose of this further note is to remind members of the apparent mimicry of *Mutilla* spp. by beetles of the genus *Thanasimus* (Cleridae); (see, e.g., Donisthorpe, 1927, *The Guests of British Ants*: 2). On comparing *M. europaea* with *T. formicarius* Linn. and *T. rufipes* Brahm., the two British species, the resemblance of facies, coloration and marking is certainly striking; but *Mutilla* is appreciably larger than the *Thanasimus* spp.: 12 mm. against 7-10 mm. for *T. formicarius*. *M. europaea* is so uncommon in this country that a resemblance to it cannot be of protective value, but obviously it must have been in the past, or is now outside this country. Carpenter & Ford (1933, *Mimicry*: 22) describe Mutillidae as "much-mimicked", and it would be interesting to know if any members have made observations abroad, especially in the tropics, where species and presumably individuals of both groups are more numerous, which confirm mimicry of Mutillidae by *Thanasimus* and related genera. E. LEWIS (952).



1. *Mutilla europaea* ♀
2. *Thanasimus formicarius*
3. *T. rufipes*

PRACTICAL HINTS—JANUARY

Anyone interested in Clearwings would do well to obtain *AES Leaflet* No. 18 (price 6d) and get started on larva-hunting without delay. Several species are easier to secure at this time of the year than later on: also it provides fieldwork at a time when things are slack.

Pupa-digging should be continued whenever the weather is suitable. If the soil is too wet or frozen, you may care to examine loose bark—particularly on willow trees, moss on old trees, etc., for the few odd pupae. If notes are kept on the species found in various sites a great deal may be added to the information that one finds in the textbooks.

Few moths will be on the wing; the Winter Moth (*Operophtera brumata* Linn.) and Early Moth (*Theria rupicapraria* Huebn.) should be found quite easily by searching the hedgerows after dark with the aid of a torch, when the males and wingless females will be located in fair numbers.

Now is the time to get all those indoor jobs done before the collecting season is upon us. Refill the camphor cells with Naphthalene or P.D.B. (Paradichlorbenzene) this latter substance being best. Order your data labels NOW, and avoid delay in the busy season. Buy any glass topped tins and collecting boxes you may require. Tins should be painted with best quality aluminium paint before use; if they are inspected every winter and treated again when necessary they will last a lifetime. Collecting boxes, too, last much longer if painted with one or two coats of clear varnish or shellac. Some of mine were left on the lawn in the rain one night and came to no harm!

Various useful pieces of apparatus may be constructed, and reference to back numbers of the *Bulletin* and AES leaflets will provide much information, whilst the ingenious collector will devise many more. A simple collecting or relaxing tin is

easily made from any suitable tin with tight fitting lid, say about 7″ × 5″ × 1¾″. Cut a piece of ¼″ cork to fit the tin, drill holes in the bottom, paint the inside with good paint, bolt cork to bottom of tin, and the job is complete. Soak cork in water when required for use; the addition of a SMALL quantity of carbolic acid will prevent mould.

Members are invited to send in requests for any information required, and any tips they may care to pass on for the benefit of others will be greatly appreciated.

R. V. Aldridge.

HOVERFLIES AND WASPS

The article by R. Underwood (2338*) (*Bull. amat. Ent. Soc.*, **13**, 101) prompts me to make the following remarks.

Firstly, although wasps do not habitually hover for substantial periods of time like Syrphidae (Hoverflies), some species of Digger Wasps of the family Crabronidae can, and do, hover quite proficiently. I have watched *Clytochrysus cavifrons* Thoms. a good deal this year in our garden in Chiswick. This wasp has a bright black and yellow striped body and its female is about the size of the Syrphid *Chrysotoxum festivum* Linn. (see illustration in the above article). When the wasp is settled on a leaf with the wings folded over the back, the exact pattern of the markings is not visible, and it resembles *festivum* to a remarkable extent. It vibrates its wings and hums with almost exactly the same note as *festivum*, and shows the same restless activity in the sunshine, running a few paces across a leaf, stopping, then taking off, hovering perfectly still for a few moments, and dropping down on to another leaf to resume its humming.

The female *cavifrons* behaving in this way has rather a different purpose from *festivum*, as she is awaiting the appearance of suitable hoverflies with which to provision her nest, to feed her larvae. When a hoverfly settles on a leaf, she will see it up to at least two feet away. She takes off from her leaf, and darts rapidly towards the unfortunate insect. She stops suddenly a few inches away and hovers for a second or two, apparently viewing the prospect. If she is approaching from some considerable distance, she may stop and hover two or three times. When three or four inches away she suddenly pounces. It is all over so quickly that I still have not been able to see how the prey is attacked. There is a momentary buzz from the victim, but I have never seen a struggle. The wasp arranges the victim under her and carries it away to her nest, soon returning to renew her vigil.

One interesting thing about the species of Crabronidae which prey on Syrphidae is that they have apparently never been recorded as preying on *Chrysotoxum* species. This may be because, although widely distributed, they are not very common compared with the more usual prey. It is, however, very tempting to suppose that *Chrysotoxum* species mimic the creatures which would otherwise destroy them. Most British *Chrysotoxum* resemble social wasps, though, and the abdominal markings of *festivum* are not really like those of the Crabronids. Mr. Underwood mentioned the long wasp-like antennae, and body size, as points of resemblance, and I raise the question of the similarity of the note emitted by *festivum* and *cavifrons*, and the general similarity of movements. Perhaps then *festivum*, which I should say is the commonest *Chrysotoxum*, does resemble a Crabronid, at least through the eyes of *cavifrons*.

It would be interesting to present *cavifrons* with some *Chrysotoxum festivum* and see what happens. I tried to do it this year but *festivum* rarely appeared when the wasps were around. A further difficulty occurs here in that it would be difficult to rear specimens of *festivum* for use, since the larval habits are not known, the larvae having been found only a few odd times. From their structure they are apparently scavengers or aphid feeders.

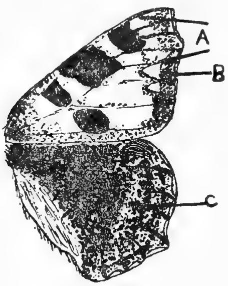
I repeatedly saw *Clytochrysus cavifrons* pounce on honey bees this summer. As soon as the wasp touched the bee, it seemed to realise its mistake and turned sharply about, returning to its leaf. Beyond that neither party ever showed any agitation. The bee would go on sipping its nectar, and the wasp would pounce on the next honey bee to appear. This is interesting since *Eristalis tenax* Linn., which resembles the honeybee, does not appear to have been recorded as prey of any Crabronidae. Possibly the very hairy surface of bee and drone-fly is what the wasps object to.

R. W. J. Uffen (1660).

A VARIETY OF *AGLAIS URTICAE* LINN. (SMALL TORTOISESHELL).

Members may be interested to hear of a fine variety of the Small Tortoiseshell which I took at Copse Wood, Northwood, Middlesex, on the 28th June 1947.

The ground colour of the forewings is dull orange, the hindwings being a dark grey with black markings at the outer margins of the wings.



"A" denotes the extent of the white marking, "B" shows two greyish-blue arrow-shaped markings, and "C" a faint dull orange patch on the hindwings (see figure).

This insect is most probably a named variety, and if any member can tell me what it is, I shall be very pleased to hear from him.

James Ranger (1002).

LETTERS TO THE EDITOR

THE TOADFLAX BROCADE

From A. J. Showler (1442).

Why should Mr. Aldridge be so violently attacked for reminding us of something we already know, but which may perhaps slip our memories?

I refer, of course, to his mention of *Calophasia lunula* Hufn. in his very useful monthly notes (*Bull. amat. Ent. Soc.* **13**, 87). Journals with a very much wider distribution than ours have given the insect publicity enough to allow anyone interested to go to the South Coast and find the larvae, so why not AES members? Perhaps it would have been better if it had been mentioned that the insect is also found at Hastings, Eastbourne and other parts of that coastline, to prevent everyone converging on Dungeness. However, those collectors whose aim is for a long series of every rare insect do not learn of its whereabouts through the AES Bulletin. Those who do are, I suspect, very moderate in their requirements, four or six insects being sufficient for them; this number when taken by one person only is not generally of serious consequence to an insect increasing its range.

From R. V. Aldridge (262).

In reply to the letters from Messrs. Bingham and Philp in *Bull. amat. Ent. Soc.*, **13**, 108, I should like to point out that full details of *Calophasia lunula* Hufn. have been common knowledge for many months. *The Entomologist's Gazette*, **5**, No. 2, devotes five pages to the species, complete with localities, and *The Entomologist's Record*, **65**, 322, also gives details of locality; therefore may I suggest that Mr. Bingham is wrong in accusing me of disclosing the locality! It is noted with some amusement that Mr. Bingham took advantage of his visit and secured specimens, whilst I, personally, have not taken a single specimen, or attempted to find them.

I do agree with what Mr. Philp has to say; it would indeed have been better to suggest searching Toadflax in other parts of the country. Furthermore, I had no idea of the Dungeness Bird Observatory, and appreciate the annoyance caused by entomologists in the area.

Regarding unscrupulous collectors—I detest them! Mr. Bingham may not realise that many are NOT members of the AES, but are people with time on their hands to dash around the country after all they can get and then submit long articles to other journals entitled "Lepidoptera Collecting, 195–" which run ". . . on the 15th July I arrived at . . . and joined Mr. X and Mr. Y; 'sugar' produced 25 specimens of that rare moth . . ." and so on!

NOMENCLATURE AGAIN

R. H. Benson (1444) writes:—

May I ask contributors to give the English names of lepidoptera (sorry! butterflies and moths) as well as the Latin. My "Log-Book" by A. G. Scorer is always a useful guide, but it is a laborious job having to translate. I admit I am fighting a lone battle; for instance, one of our junior members, P. E. Smart (2293*), is against me, but even more scientific journals than the *Bulletin* ask their contributors to do likewise (not that they usually carry out such requests).

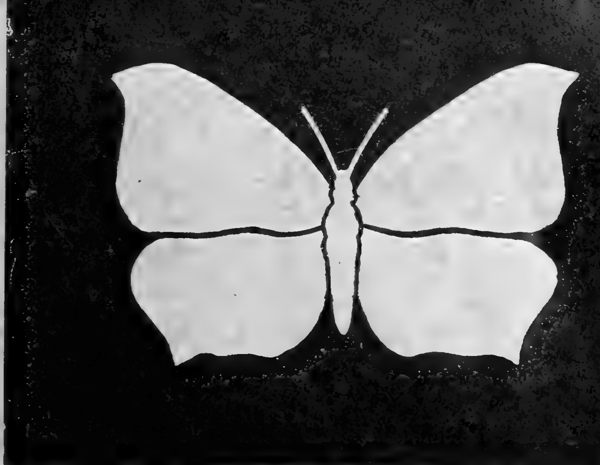
Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. 1955.

VOL. 14

No. 170

•

RUARY - - 1955



THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

World List abbreviation : *Bull. amat. Ent. Soc.*

EDITED by B. R. STALLWOOD

A E S
BULLETIN

No. 170

FEBRUARY 1955

A MESSAGE FROM THE PRESIDENT

Having just completed (19.11.54) my one unpleasant Presidential task, namely writing to a rather large number of members who have failed to pay their 1954 subscriptions, I am prompted to rush into print once again.

I feel that a section of our membership does not correctly appreciate the objects of the Society. As all members on joining are presumed to subscribe to this object I will, for the benefit of all who have lost their copy of the Rules, repeat it here:—

> "The object of the Society shall be the promotion and dissemination of entomological knowledge by every means possible and particularly the encouragement among the younger generation of a keen and a broad interest in the science".

Each year we are involved in the expense of writing to a number of members who, for one reason or another, neither pay, nor indicate their wish to resign. Those members who do not pay each cost the Society over 4s. (*Bulletins*, postage, etc.) and that means 4s. of the subscriptions of the conscientious members is wasted, and not devoted to the proper object. Surely that is rather mean behaviour to one's fellow-members.

Also I note that many of those who resign, often after costing the Society the previously mentioned 4s., give as their reason the fact that they get nothing out of the Society. The object of the Society, and that means its members, is giving and not taking. If you are unwilling to give when you cannot receive, resign by all means but fulfil your financial obligations first, and refrain from taking secretly from the pockets of your fellows.

Another reason often given for resigning is that the quality of the articles is poor or that they are too elementary. This is very unreasonable as in most cases the person making this excuse has never contributed to the *Bulletin*. The Editor can only publish what he receives and maybe has to publish less useful matter through lack of better articles.

I appeal to all members in the year 1955 to realise their responsibilities in the Society. The Council spends a great deal of time, individually and collectively, in trying to maintain the objects of the Society, but without the co-operation of the members their task is impossible of fulfilment. Those of you who consider yourselves well versed in the science, undoubtedly received help and guidance in the past, possibly from the Society. It is now your turn to give guidance and help to the less informed.

Send in those articles which you so proudly contribute to the other journals patronised by the leading lights. Offer a little of your time and undertake one of the many tasks that others are doing for you in their spare time in running the Society. Above all, at least send your subscriptions NOW. Add a small donation; it will be very welcome, if you are unable to help the less fortunate members in any other way.

P. C. le Masurier (978).

BUTTERFLY MIGRATION

The *Centre d'Observation des Migrations de Papillons* would welcome correspondents interested in butterfly migration. In return for observations, they would send reports from Germany and Switzerland. Members interested should write to M. G. Warnecke, Hohenzollernring 32, Hamburg-Altona, Germany.

ANOTHER BREEDING RECORD FOR *TELENOMUS*

I was very interested to see Mr. Crotch's breeding record for the Sceleonid egg parasite, *Telenomus* (Hym. Proctotrupoidea) bred from Saturniid eggs (*Bull. amat. Ent. Soc.* **13**, 109), since I have just been given specimens, bred in this country. These were bred from a small batch of eggs of *Saturnia pavonia* L. (Emperor moth), which were collected from a heather shoot at Bishops Dyke, near Denny Lodge in the New Forest, in July of this year. From these

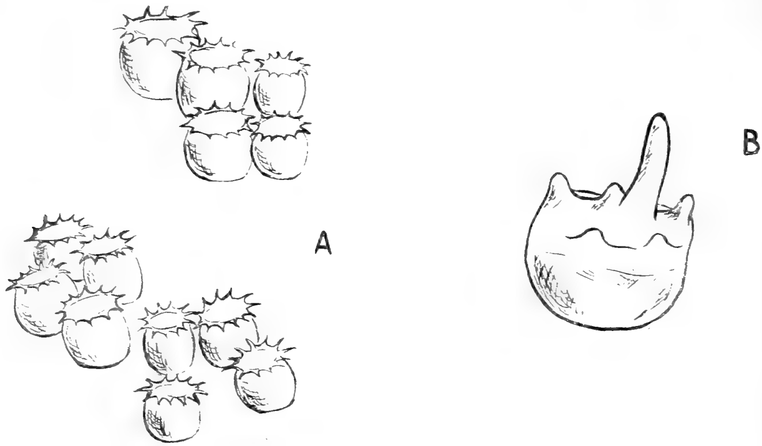


Fig. 2: A—Eggs of *Troilus luridus* after emergence of nymphs (×8).
B—Egg cocoon of the Spider *Theridion pallens* Blackwall (×8).
Both found attached to leaves of *Viburnum lantana* L.

the earlier stages were also frequently seen on the flowers. During May and June all the larval stages were recorded, and adults from May to September, but most of the records of adults were at the end of the season.

A. nemorum is a predaceous insect throughout its life, feeding on aphids, mites and other small arthropods. Both aphids and mites were possible prey on the Wayfaring Trees that I examined although I did not actually see feeding in progress.

The eggs illustrated in Fig. 2A were found attached to the upper surface of a leaf on August 25th, 1952. They were almost certainly eggs of *Troilus luridus* Fabr. When I found them they had already hatched and there were no larvae anywhere near. Exactly a year later I found a fourth instar nymph of *Troilus luridus* engaged in feeding on the beetle *Galerucella viburni* Paykull. The proboscis of the bug was inserted into the beetle near the base of the wing. The beetle appeared dead but I put both predator and prey into a collecting tube for further examination. Two hours later the meal was still in progress but the bug relaxed its hold when I took it from the tube.

This record is particularly interesting, as Butler (1923) mentions that *T. luridus* has been known to feed on *G. viburni*.

The only other predaceous Heteropteron found was a single specimen of *Deraeocoris ruber* L. in July, but I have no evidence as to what this insect was feeding on.

Other Predators

Except for the parasites, all the more important checks on the aphids have now been mentioned, but there are some others.

In the curled leaves I frequently found the Carabid beetle *Risophilus atricapillus* L. This is probably nocturnal, as I never saw it active during the daytime, and it may feed on aphids.

At various times throughout the summer Cantharid beetles of several species were found resting on the leaves and flowers of the Wayfaring Tree. These beetles are carnivorous and no doubt take their toll of the smaller insects which frequent the shrub. A full list of the species concerned will be given in an Appendix.

Many kinds of spiders live on the shrub although none is confined to it, and as insects form the bulk of their food they are important links in the food-chains which can be worked out. Some of the spiders undoubtedly feed on aphids as well as on other small insects and on each other.

I have not collected the spiders systematically nor attempted to identify many of them, but three which were particularly common may be mentioned. They were *Misumena calycina* L., and *Xysticus viaticus* L., both of the family Thomisidae, and *Aranea cucurbitina* L. of the family Argyopidae. The first two are crab spiders, which make no web but lie in wait for their prey or hunt for it.

Aranea cucurbitina made its web either between the two opposite half-expanded leaves at the end of a shoot or across the space between the two edges of a concave young leaf. Insects which I found entangled in the webs included small Diptera of many kinds, leaf-hoppers, jumping plant-lice and some of the smaller Hymenoptera. In some cases the spiders were seen feeding on their captives.

Many of the spiders make use of the empty curl-galls as places of shelter for themselves or their eggs. Others lived among the leaves or flowers.

Fig. 2B shows an egg-cocoon of the spider *Theridion pallens* Blackwall. Several of these were found attached to the lower surfaces of leaves during July.

Birds of many species will also eat aphids but I have no records of birds taking aphids from the Wayfaring Tree and they are of only minor importance compared with other predators.

Parasites of Aphids

Two related genera of parasitic Hymenoptera are parasites of aphids. They are *Aphidius* and *Praon*, both of the family Braconidae. Eggs are laid in the bodies of the aphids and the larvae feed inside the host but do not kill it until they are ready to pupate. Usually there is only one parasite to one aphid.

Aphidius pupates inside the host but before doing so it makes a hole in the ventral wall and cements the aphid, which is now dead, to the leaf or stem upon which it is resting. When the parasite emerges the dead aphid is left behind with a round hole in it showing where *Aphidius* came out.

Praon behaves rather differently. Before pupating, the larva comes out from the dead aphid and makes a case which is rather like a flat truncated cone. This is attached by the base to a leaf or stem and is found surmounted by the empty shell of the host. The example shown in Fig. 3A was found on June 21st cemented to a leaf of the Wayfaring Tree. I kept it in a pill-box until the parasite (Fig. 3B) emerged on July 8th.

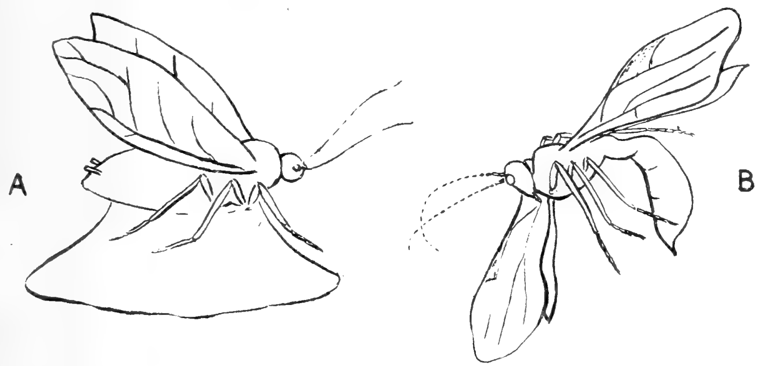


Fig. 3: A—Cocoon of the parasite *Praon* surmounted by the empty shell of the host—an aphid (×12).
B—The parasite itself (×12).

Mites Found With Aphids

At this point it would be convenient to mention some mites which were found in June among colonies of *Aphis lantanae* Koch. They were immature forms as they had only six legs. They were orange-red in colour with darker red eyes. The mites were 0·6 mm. in length. In July larger adult red mites were found in the curl-galls which were caused by the other species of aphid, but by this time the aphids had gone. Both lots of mites may or may not be of the same species. I have no information about them except their occurrence as stated, but it seems likely that in both cases they were acting as scavengers.

Honeydew

As we have seen already, the aphids form the first link of a great number of food-chains based on the sap of the Wayfaring Tree. There is another way in which aphids make this food available to other animals and that is by the production of honeydew.

Aphids and some other sap-sucking Hemiptera have to take in far more sugar and water than they need in order to obtain sufficient proteins and other essentials of their diet. The excess sugar and water is voided as honeydew, which is much sought after by certain bees, flies and especially ants. Some ants go to the length of keeping eggs of aphids in their nests and putting them out to feed on suitable plants after they have hatched. I do not know if this is done with the species of aphids that we are considering, but the ants certainly do associate with them on the shrub for the sake of the honeydew.

All through the active season there were ants on the shrub, either with aphids or moving towards or away from them. Probably the ants were sometimes foraging for other food and I did sometimes find them on shrubs that harboured no aphids at all, but most of the activity of ants on the Wayfaring Tree was connected with aphids and honeydew.

Sometimes the honeydew was taken directly from the aphids and sometimes the ants obtained it from the leaves or shoots where it had been deposited.

In the localities where this study was made three species of ants were found associating with aphids in the way described. They were:—*Lasius niger* L., *Myrmica ruginodis* Nylander and *Formica fusca* L.

Cuckoo-spit and Froghoppers

Although the aphids are the most important of the sap-sucking insects, there are some others. During the last ten days of May and the whole of June in 1952 and during June only in 1953 the Wayfaring Tree, in common with many other plants during roughly the same time, was decorated with the small masses of froth known as cuckoo-spit. These were to be seen on the leaves, on the younger shoots and on the stems of the fruits which at that time of the year are just beginning to form.

Inside each piece of cuckoo-spit will be found a pale green or yellowish larva or nymph of a froghopper, which is the common name given to members of the family Cercopidae. The frothy material is produced by the insect itself from waste substance which must be rather similar to the honeydew of the aphids. Another secretion mixed with it gives it the properties of a soap solution. The bubbles are blown by air which is expelled from a narrow cavity beneath the hind end of the abdomen.

It has been suggested that the froth serves as a protection against would-be predators and this may be so to a certain extent, but it is probably more useful as a protection against drying up. The insect certainly dies very quickly when removed from the froth.

I was not able to identify the immature insects found in the cuckoo-spit, but a survey of the adult Cercopidae found on the shrub during the year may give a clue. Most of them belonged to two species which occurred frequently and in about equal numbers. They were *Aphrophora spumaria* L. which was present from the last week in June until the middle of October, and *Philaenus leucophthalmus* L. from the last week in June to the end of September. It seems very likely that the cuckoo-spit was caused by them.

Cercopis vulnerata Germar, which is a larger froghopper with a striking black and red coloration, occurred in some numbers at the end of May and I found specimens regularly until the middle of June.

Other Hemiptera-Homoptera

Centrotus cornutus L. (Membracidae) was frequent at the end of May.

Cixius nervosus L. (Cixiidae). A few specimens were found in June and again in September.

Trichochermes walkeri Foerster (Chermidae). A single specimen was found in August. This had clearly strayed from a neighbouring Buckthorn (*Rhamnus catharticus* L.) on which it causes galls.

Leaf-hoppers (Jassidae) and jumping plant-lice (Chermidae) were frequent between June and November. There were several different species but I have not been able to identify them.

K. C. Side (2140).

(To be continued)

References

1. Butler, E. A. 1923, A Biology of the British Hemiptera-Heteroptera, p. 72.
2. Killington, F. J. 1936. Monograph of the British Neuroptera.

PRACTICAL HINTS—February

Very little field work can be done this month. The really determined types may care to continue pupa-hunting; but results tend to be poor. A few moths may be obtained by searching the hedgerows with a torch after dark; these will be mainly *Theria rupricapraria* Schiff. (Early Moth). Towards the end of the month, trunk searching by day may reveal a few *Phigalia pilosaria* Schiff. (Pale Brindled Beauty). The female is wingless and not so easy to find. The males are attracted by light at night.

Another trunk and post squatter is *Erannis leucophæaria* Schiff. (Spring Usher); again the female is wingless, and the males come to light. The more local *Apocheima hispidaria* Schiff. (Small Brindled Beauty), is to be found on tree trunks from the end of February to early April. Should the weather be mild for the time of year, many larvae will be found sitting on the tip of grasses or on the barren twigs on hawthorn, blackthorn, etc. A good torch and keen eyesight are required to spot the geometers!

Though I am not a micro-lepidopterist myself, I understand that beating thatch, Yew trees, Gorse, etc., yields a number of micros. Since the insects are more likely to fall than fly, the net should be held under the spot to be beaten.

R. V. Aldridge (262).

•

SOME PROBLEMS ON PUPAE

(Continued from Vol. 13, p. 19.)

This belated sequel to my previous contribution has found itself largely forestalled by the very able articles by P. B. M. Allan, *Bull. amat. Ent. Soc.*, **13**, 77, 90.

Like Mr. Allan, I discovered the pitfalls attendant on wintering one's pupae in tin boxes and decided to make a pupa cage on the lines advocated by the late Frank Littlewood several years ago. I feel however that my experiences covering a number of years justify me in saying that efficacy need not necessarily be sacrificed by the adoption of simplicity, and the following modifications to Mr. Allan's design have proved completely satisfactory.

My own cage was made from a margarine box, the top edges of which were trued up to make a close fit with the glazed lid. A false bottom of stout cardboard rested on battens 2″ from the bottom and a rectangular hole was cut in the false bottom, to enable an enamelled dish about 6″ × 4″ to sit over it. The dish should be filled with powdered peat, and saturated with water when the cage is ready for occupation, while from time to time, the moisture content can be maintained by replenishing with water as necessary. The peat appears to last indefinitely; it has remained unchanged in my box for over a dozen years without any trace of mould or deterioration manifesting itself. The use of peat has all the attributes of a water trough without any of the latter's disadvantages. Regarding the gauze tray, I fitted mine directly under the glass of the lid and secured it with a few sprigs, in the same manner as the backing of a picture is held in its frame; this is of course only a minor point, but one will note that the gauze tray lifts off with the lid.

The method of housing the pupae as advocated by Mr. Allan is, I respectfully suggest, one which can be considerably simplified. Littlewood's idea was to make a series of artificial cocoons out of thin paste-board and arrange them 'bandolier' fashion round the sides of the box, but this tedious complexity appalled me, and my innate laziness soon suggested a somewhat novel but highly successful expedient. I pinned broad pieces of cotton wool in the bottom of the cage filling up the space between the sides and the rim of the dish. Each pupa was then ceremoniously anointed with a spot of liquid glue on the tip of the last segment, and it was then gently pushed into the wool, facing the side. You can have two rows of pupae facing each side (dependent on size of course) and the second row can be 'staggered' to give the moths a clear run to the side through the orchestra stalls. I have yet to see a moth running all over the box with bits of pupa case stuck to it, nor have I ever had reason to suspect that the glueing process has been the cause in the very few cases where a pupa has died.

Frank Littlewood was very intrigued with the idea when I wrote him about it and he replied:—"Your 'brutal' idea of glueing the pupa to the wool is a great flight of imagination. I should never have thought of that: After all, the proof of the pudding is in the eating, and if it works, that is everything. There's plenty of

room for ingenuity in our hobby, though, so far as my experience goes, very few entomologists display much. They seem content to follow the old ways."

So far as storage is concerned, I keep mine in a cellar during the winter, but I imagine an outhouse would be equally suitable. When the time for emergence arrives I bring the box upstairs to a warm room, and if there is a mixed grill inside, it stays until all have emerged. The box affords a good deal of latitude of treatment, and the see-saw temperature changes occasioned by periods in a warm room and re-consignment to a cellar, do not appear adversely to affect the occupants to any marked degree. For example, in 1953 the box contained a mixed assortment of pupae embracing a number of Brindled Beauty bred in 1952 which failed to emerge in 1953. The box was kept in a warm room for a few months in the Spring of 1953 and replaced in the cellar in August. In March 1954 the box was once more brought upstairs, when, with one exception, all the Brindled Beauty pupae emerged, after 20 months in the pupal stage. Curiously enough all were of exceptional size, the females in particular.

To sum up, the modifications to the Littlewood Pupa Cage as suggested by myself have proved such an unqualified success over a number of years that I humbly recommend them for earnest consideration by fellow entomologists.

L. G. F. Waddington (169).

JULY ON THE COTE D'AZUR

As the A.E.S. are planning to go to the South of France this coming August, these notes may be of some interest to those planning to go.

I was in Cannes this past summer, and collected a considerable number of interesting specimens. I must confess, though, that I thought it even more exciting just to observe, and admire the profusion of insect, plant and animal life.

The majority of insects can be seen on the steep slopes of the Maritime Alps, overlooking the azure Mediterranean. Both Common and Scarce Swallowtails and Apollos glide over the flowers alongside the winding roads; floating tantalisingly over the mountain sides, often above steep slopes of about 1,500 to 2,000 feet.

The run from Nice to Monte Carlo —the fabulous Grande Corniche— offers a typical example of the countryside, both from the artist's and the entomologist's point of view. This skilfully planned road winds along the summit of the coastal mountain range, overlooking breath-taking views down to the sea. On the southern side, in the rocky valleys and on wooded slopes, Fritillaries, Blues, Pale and Ordinary Clouded Yellows, Swallowtails and Orange Brimstones* fly among the rocks.

On the northern slopes, down into deep, wooded gorges, Ant Lions flutter feebly for a few yards as one disturbs them in the heather. The homely Grayling is seen in large numbers.

Sometimes one stumbles across a hidden valley, a European Garden of Eden, teeming with gaily coloured, bustling insect life. Delicate small blues, clumsy dung beetles, dainty dragonflies, busy Hummingbird Hawks and droning bees jostle each other in the glorious sunshine— blissfully ignorant of the ways of marauding entomologists. One cannot find the heart to disturb them.

One misses the familiar wasp of our native fields, for, in this insect paradise its place is largely taken by a comprehensive range of horseflies— ranging from multitudes of the small plebeian family models, to the inch-long, high-powered jobs, more suitably equipped to assault dinosaurs than horses.

I have caught Marbled Whites ranging from vivid black markings, through albinos to a large browny-yellow specimen the size of a Brimstone. The Pale Clouded Yellow varies remarkably with altitude. Var. *helice* of the Clouded Yellow is often encountered.

On my way back, I stopped for a weekend at the Lac d'Annecy, in the Haute Savoie, and took a trip up Mont Blanc. I saw both types of Swallowtail; Purple-edged Coppers; Mountain Ringlets; White Admirals in the low country; Stag Beetles, and numerous Goldchafers, apart from the Bath, Black-veined and Wood Whites as in the whole of the Southern half of France.

I am sure that you will enjoy a trip to the Côte d'Azur, as I did, and find it both enjoyable and fruitful.

Michael S. Kay (2399*).

[*Presumably *Gonepteryx cleopatra* Linn. -Ed.]

Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists Society, 1 West Ham Lane, London, E.15. 1955

PUBLICATIONS
of the
Amateur Entomologists' Society

"THE AMATEUR ENTOMOLOGIST"

Volumes in print are

Volume 5

Contains articles on "Some British Moths Reviewed" by W. H. T. Tams; "Habits of some British Moths" by Dr. E. A. Cockayne; "Setting Lepidoptera" and other papers.

Price 4s 6d

Volume 8

Contains illustrated articles on "Collecting Dragonflies," "Collecting Micros.", Sweepnets, "Collecting Mosquitoes," an eight-page list of standard books on Entomology, etc.

Price 5s (Members 3s 6d)

Volume 9

Practical Methods and Hints for Lepidopterists. Contains illustrated instructions for making many types of breeding and other cages; articles on breeding and collecting larvae; and illustrated instructions for making beating trays.

Price 5s (Members 3s 6d)

Volume 10

Contains illustrated articles on "Collecting Lacewings," "Drawing Insects," "Collecting Caddises," "Photography of Caterpillars," etc. 12 photographic plates.

Price 6s (Members 4s 6d)

Volume 11

A Coleopterist's Handbook. Describes the tools and apparatus and methods of collecting British beetles; their habitats, commensals and pre-adult stages; how to record, photograph, make a personal collection and conduct a local survey. 20 plates.

Price 15s

AES Bulletin

Volume 7, 1946-8.	232 pp., cover and index.	21s
Volume 8, 1949.	96 pp., cover and index.	10s 6d
Volume 9, 1950.	108 pp., cover and index.	10s 6d
Volume 10, 1951.	124 pp., cover and index.	10s 6d
Volume 11, 1952.	116 pp., cover and index.	12s 6d
Volume 12, 1953.	96 pp., cover and index.	12s 6d

VOL. 14

No. 171

RCH - - 1955

THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

World List abbreviation : *Bull. amat. Ent. Soc.*

EDITED by B. R. STALLWOOD

AES

Members can help the Society in several ways:—

(a) By dealing with advertisers and mentioning the *Bulletin.*

(b) By bringing in new members. (Subscription, 12/- per annum. Juniors, 6/- per annum.)

(c) By buying AES publications and suggesting Public Libraries should buy them.

(d) By friendly co-operation with other members.

(e) By taking just that extra bit of trouble required to record happenings of note for the *Bulletin.*

AES NOTICE

WHERE TO WRITE

Membership applications, offers of help to: D. OLLEVANT, *3 Salcombe Drive, Morden, Surrey.*

Advertisers to L. W. SIGGS, [illegible] *Repton Road, Orpington, Kent*

Changes of address and non-arrival of Bulletins *to* B. L. J. BYERLEY, [illegible] *grove Road, Harrow, Middlesex.*

Offers to lead Field Meetings, exhibit etc., to: K. H. BOBE, *49 Hengist Road, London, S.E. 12*

Manuscripts, drawings and books for review to: B. R. STALLWOOD, *49 Southfield Gardens, Strawberry Hill, Twickenham, Middx*

Subscriptions (12/- per annum, 6/- for Juniors to R. W. WATSON, *15 Halstead Road, Bitterne, Southampton*

Youth matters to: S. M. HANSON, *167 Gunnersbury Park, London, W.5.*

A E S BULLETIN

No. 171

MARCH 1955

THE NEOVANDALISM

I am seriously disturbed by the growing unrestricted use of light-traps and the possible dangerous effect it may have on the future of our lepidopterous fauna. On all hands I hear from my friends and colleagues that they are rushing to, or have already equipped themselves with these instruments of destruction. It is impossible to pick up any journal on entomology which is not full of the notes from these enthusiastic collectors reporting on and boasting of their prolific captures. And the number grows. Soon every collector—and there must be several hundreds of such in these islands—will have equipped himself, and the nightly toll of destruction will be running into thousands upon thousands. I know of one collector who advertised the sale of the whole of one night's collection, estimated at about 1000, for the sum of one pound. A friend of mine wrote and asked for all the Micros collected and received back a pill-box crammed to the lid with these hapless creatures; it is unnecessary to state that not a single one was fit to be kept as a specimen and most could not be recognised.

"What's that thing, Daddy?
"That's what we used to use before we killed off all the moths with light-traps, Sonny!"

For some years I have practised breeding and releasing certain species of moths in order to ascertain if by adding to existing local populations, it was possible to boost up the numbers of any particular species released. My experiments have been purposely carried out on species which I knew to be rare in my neighbourhood. The results of releasing even a few have given ample proof that it is possible to upset the balance of Nature in favour of any particular species and that there is an immediate increase in its numbers which may persist for a number of years. I may cite two, among a number of species on which these experiments were carried out, viz., *Hyloicus pinastri* Linn. and *Dilina tiliae* Linn., both of which were extremely rare in my neighbourhood. The chance finding of pregnant females of these insects enabled me to breed a large number of specimens, one hundred of both of which were released from my study window. *Tiliae* has been not uncommon ever since, viz., for at least a decade, and *pinastri* remained common until a local collector making a systematic tour of the neighbourhood daily, examining pine-trunks, took no less than three dozen specimens in less than a fortnight, which he passed on to another avaricious collector. This decimation led to an immediate fall in the numbers of the insect, and this year, the first for at least ten years, I have failed to observe a single specimen. Thus we see that the result of deducting from the numbers of a local population is diametrically opposite to that of adding to it, and results in their temporary or lasting eclipse. It must be pointed out that most insects are waging a fight against their parasites, and manage to hold their own so long as their numbers are high; but weaken their numbers and they are immediately swamped by the superior numbers of the parasite; this, in effect, is what over-collecting does, so how immeasurable must be the effect of the growing use of light-traps?

I fully realise to my grief that it is

quite hopeless to expect the avaricious collector to subscribe to a self-denying ordinance, and to give up the use of his trap; the light-trap has come to stay and its use to increase, so what can we do to counteract its effects? I would suggest that every entomologist addicted to this drug, should go in for rearing larvae and that he should make it a golden rule to put back into Nature the same amount as he withdraws. Females, even if only one be taken, should be preserved for breeding purposes; it is possible that he will find his specimen worthless by the time it has completed its egg-laying, but there is a good sporting chance that he will be able to rear a fine and perfect series as well as having plenty to release. SO BE A SPORT! If every trappist puts back into Nature what he takes out, we need not cavil on the use of light-traps, nor fear for the propagation of a fauna. It is unfortunate that most of our entomologists are collectors for the sake of amassing collections, and of no higher estimate than the average stamp-collector; I only wish that I could coin a less cumbersome name for them than 'entomoliphilats'.

F. C. Fraser (890).

CATCHING ORANGE UNDERWINGS

For those lepidopterists who, like me, believe that the most satisfactory way of doing anything is that requiring least effort—other things being equal—I offer the following hint from my own experience.

I have often read and heard complaints about the difficulty of catching the Orange Underwing moth (*Brephos parthenias* Linn.), and used myself to experience the same frustration at seeing them taking off from a birch twig about 10 ft. up, and slowly and tantalisingly mounting to about 30 or 40 ft., only to settle again at the very tops of the birch trees. In the days of my youth, when getting up early in the morning was a simple matter (note that, Juniors!)—being compulsory—I used often to be in the local birch woods well before 10 o'clock, and found that I frequently disturbed Orange Underwings from the short grass of glades. In the cold morning air they couldn't fly so rapidly as usual, and were easily netted before rising out of reach.

I believed at the time that they were basking in the slanting rays of the early morning sun (being still war-time, *Double* Summer-Time was in force, so "sun" time was about 8 a.m.), but, as they were always perfect specimens, and as I can think of no cause for their descent to ground level since the previous day, I now suspect that they may have been freshly emerged.

Peter G. Taylor (719).

"ASSEMBLING" OF *EUPSILIA TRANSVERSA* HUFN. IN DECEMBER

I was returning home on the night of the 22nd of December when, by the light of a cold frosty moon, I saw flit across my path a rather large moth for this time of year. As it disappeared into the darkness, and left me standing there trying to follow its track, another of the same species came fluttering past me and settled a little further on, on the top of an oak paling, a number of which ran alongside the road.

Wishing to find out the name of the species I followed it, and saw to my astonishment about five of these moths settled, or fluttering round the post. At my approach these flew off, and I saw a newly emerged and perfect female; I left this in the hope of catching a male, and soon one returned and alighted on the next post. I caught this in a match-box (the best receptacle I had at the time, and returned to watch the female. I was too late, however, as she had already found a mate and had flown off.

The moth turned out to be a fine *Eupsilia transversa* (Satellite Moth). South says it has often been recorded in November, but I would like to know if other members have ever found it in late December, assembling, and all, as near as could be judged, perfect specimens.

The weather had already been extremely cold, and frost had occurred a day or two before.

D. Shapley (2409*).

LETTER TO THE EDITOR

AN UNKNOWN ENEMY OF *SATURNIA PAVONIA* LINN.

From E. S. Lewis (373).

Can anyone inform me as to what moorland predator collects cocoons of the Emperor Moth into little heaps, extracts the pupae neatly, and consumes them?

The commonest bird in the locality I have noticed this year is the Meadow Pipit. There are also Carrion Crows, Curlews, an odd Snipe or two, and some Gulls.

A STUDY OF THE INSECTS LIVING ON THE WAYFARING TREE (3)

(*Continued from page 14*)

Galls

In addition to the curl-galls which have already been described there are two other kinds of galls to be found on the Wayfaring Tree.

The first of these is caused by a mite, *Eriophyes viburni* Nalepa. Although this study is primarily concerned with insects, it would be incomplete without an account of these very common galls. They first appear soon after the opening of the leaves in April, some being found on very young leaves less than an inch long. At first they are minute red blisters on the upper surface of the leaves, and measure only 1 mm. across, but they soon become larger and are about 5 mm. across when fully grown. Below, where there is an entrance, the gall consists of a light brown patch surrounding an opening. Both sides are covered with small hairs, those on the upper side being transparent and either simple or stellate.

Sometimes the galls are reversed so that the opening is on the upper surface of the leaf and the raised portion on the lower, but this is unusual. On April 22nd I took four galled leaves at random and found 57, 60, 24 and 10 galls on them. Of this total of 151 galls only 5 (i.e. 3·3%) were of the reversed form. On May 10th another count was made and this time out of a total of 210 galls made up of 5, 2, 37, 37, 29, 33, 25 and 42 there were 17 (i.e. 8·1%) of the reversed form.

The number of galls on a leaf varies from one to over a hundred, the most which I saw on one leaf being 250. When the number is large the leaf is stunted and abnormal in shape. Sometimes the galls are so close together that they coalesce and the separate galls cannot be distinguished.

The presence of these galls does not prevent a leaf from being attacked by other insects, but the galls themselves were always avoided by the insects which I found feeding on such leaves.

I found two kinds of mites living inside the cavities under these galls. Some were white and pear-shaped with four legs at the larger end. These I took to be the causers of the galls. There were also present some slightly larger mites which were able to leave the galls and run about on the leaves. They had eight legs and their backs were patterned in light and dark brown. These may be the commensals referred to by Swanton (1912).

The galls of *Eriophyes viburni* were very common in all the localities which I visited and were present all through the growing season.

The other gall is caused by one of the Diptera, *Phlyctidobia solmsi* Kieffer, which belongs to the family Cecidomyiidae. These were also present in all the localities which I visited but were less frequent although they could be described as common. Swanton says it is rare in England and was first discovered by him in this country in 1904 on the North Downs near Maidstone. My localities were on the North Downs at distances varying from 8 to 15 miles from Maidstone. As the galls are now common we can assume that *Phlyctidobia solmsi* has greatly increased during the last 50 years in this district.

These galls appear later in the spring than the mite-galls, my first records being May 22nd in 1952 and June 13th in 1953. They are larger and flatter than the others and are less hairy. They differ also in having no entrance from the exterior. At first the galls are green. Then the edges turn red and later the whole gall becomes reddish brown and eventually purple. The lower side consists of a pale hairy disc. The number of galls on a leaf varies but is never so large as with the mite-galls.

Each gall contains in the spring a yellowish larva about 1·7 mm. long. Some time during July these larvae eat their way out through the lower side of the gall and presumably fall to the ground, although this is uncertain, as I was unable to observe the actual exit. By the middle of August every gall has a small hole in the lower side and the galls themselves are empty. Swanton says that the insect pupates in the ground. I was unable to follow the life history any further and cannot say whether the insect hibernates as a pupa or as an adult fly. What is certain is that the eggs are laid in the leaf early in the following spring.

LEPIDOPTERA

During their larval stages three species of Lepidoptera feed on the Wayfaring Tree. All are small moths. I did find some other caterpillars on the leaves and flowers at various times. Most of these would not feed on the shrub, however, and I have no doubt that they were there accidentally, having dropped from overhanging branches of other trees and shrubs, or arrived by other means. In a few cases the leaves did appear to have been eaten but apart from the three regular species discussed below the only caterpillar which I saw actually feeding was that of *Euproctis chrysorrhoea* L. (Lymantriidae), the Yellow-tail moth. I saw this eating the leaves on two occasions.

The larvae of *Peronea schalleriana* L. (Tortricidae) were found from June to September feeding in pockets in the leaves. The pockets were formed of folds, the edges of which were drawn together and fastened with a little silky material. The pupae (fig. 4a) were also found in these pockets. Each abdominal segment of the pupa has two transverse rows of spines, except the last segment, which has four rows. Of these four rows of spines on the last segment the second and fourth are shorter than the first and third.

When the moth emerges the pupal case is half pushed out from the pocket, and on the shrub the empty cases can often be seen with wide slits at the anterior ends where the moths came out.

I found pupae both in June and in August. The June ones produced moths at dates between June 10th and 29th in 1952 and between June 22nd and 28th in 1953. The August ones gave rise to moths on September 24th in 1952. Another moth emerged as late as October 16th from a pupa found on September 2nd.

From this it would appear that there are two generations in the season, but this is contrary to what I can find in the literature. Ford (1949) states that the pupae are found in August and September. This agrees with my second brood, specimens of which were identified as *P. schalleriana* at the British Museum (Natural History). Unfortunately, I have not yet had my June moths examined by an expert and I am in some doubt whether to say that there are two broods, as there is the possibility that the June moths may be of a different species.

Lithocolletis lantanella Schrank (Gracillariidae) is the leaf miner of the Wayfaring Tree. There are two generations of this species in the year. The first larvae were found on June 28th and I found them frequently afterwards all the time that the leaves were on the shrub.

The larva is bright yellow in colour and noteworthy in that it has prolegs on segments 7, 8 and 9 but not on 10 which is not a usual arrangement in larvae of Lepidoptera. The pupa (fig. 4b) is yellow and brown. Both larvae and pupae are found in the leaf-mine. The pupae of the first brood are usually to be found in July and of the second in September and October.

The leaf-mine is a blotch on the lower surface of the leaf between two veins. The floor of the cavity is formed by the lower epidermis of the leaf and this is lined with silk. The lining causes the shortening of that part of the epidermis which is thus thrown into folds, which can be seen on the outside as a series of close ridges. At the same time a cavity is formed between the lower epidermis and the rest of the leaf, and it is in this cavity that the caterpillar lives and feeds. When it has gone through all its instars and is fully grown, it pupates and remains within the mine until its emergence as a moth at the end of July, in the case of the first brood.

The story of the second generation is rather different. The larvae of this brood are to be found in September and October, and I actually found one still feeding on November 9th. Some of the late ones were in leaves that had taken on the red tints of autumn. None of the pupae that I collected of this second brood produced any moths the same year, nor did any emerge the following spring, possibly through conditions being unsuitable. If the species does overwinter as pupae, then they must fall to the ground with the leaves. I tried to prove this by finding them in the fallen leaves during the winter, but I could find none in spite of examining several hundred leaves. Neither Ford (1949) nor Meyrick (1927) has anything to say on this point.

L. lantanella suffers from at least two parasites. On July 19th, 1952, I collected twelve leaves containing leaf-mines and kept them in separate containers. I was away until August 17th, and I then found that only one moth had emerged. Three of the mines had produced the Braconid *Apanteles circumscriptus* Nees, one a Chalcid which I have not identified, one a dead caterpillar, and the other six nothing at all, either moths or parasites having emerged before I collected the mines.

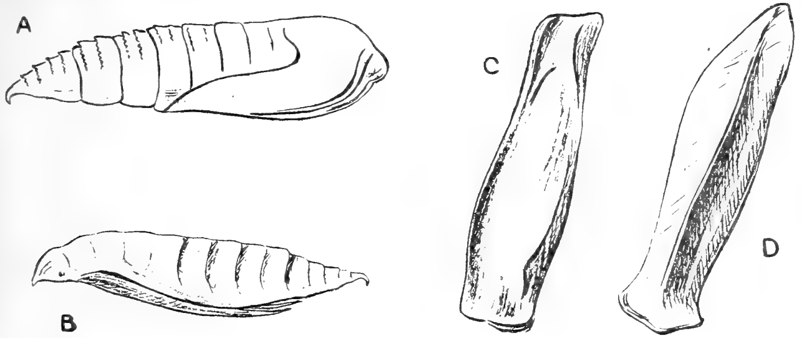


Fig. 4 : A—Pupa of *Peronea schalleriana* L. (× 7).
B—Pupa of *Lithocolletis lantanella* Schrank (× 11).
C and D—Larval cases of *Coleophora ahenella* von Heinemann (× 7)

Although this sample is far too small a one on which to base any conclusions it does make it clear that *A. circumscriptus* is an important factor in keeping the moth's numbers down. I frequently found the cocoons of this parasite in the leaf-mines. When they were present there was nothing left of the caterpillar unless the small black fragments which I took to be excrement represented its dried-up remains.

The cocoon is of a cylindrical shape with rounded ends and is suspended between diagonally opposite corners of the cavity of the leaf-mine by means of two very fine threads. It is made of a thin transparent material, as are also the threads by which it is suspended. The length of the cocoon without the anchoring threads is 3.5 mm. When the parasite emerges it makes a clean transverse break in the cocoon, about a quarter of its length from one end.

When *A. circumscriptus* attacks larvae of the second brood it emerges in the same year as I had one emerge on October 18th from a leaf-mine which I collected on September 28th.

Like the Tortricid moth already discussed, the leaf-mining moth of the Wayfaring Tree was common in all the localities that I visited for this study.

The last of the three Lepidoptera which are regular feeders on the shrub is *Coleophora ahenella* von Heinemann. This moth is far less common than the other two. Only a few larvae and pupae were found, some in June, and some in September. The only moth which I have had emerged from a pupa found on June 6th, the emergence taking place on June 30th. I have not had this specimen examined by an expert and it may prove to be a different species as the dates do not agree with those given by Ford and Meyrick, both of whom state that the larvae are found in August and September and the moths in June. This would imply that the insect overwinters as a pupa but, if so, it could not be found attached to a leaf the following June as mine was. Some pupae which were found in September were kept until the next spring but failed to produce any moths.

These moths are remarkable in that the larvae make themselves cases to live in. I have not been able to find out what material the case is made of. The cases (fig. 4 c and d) are attached to the upper surface of the leaves, the early ones being almost upright and the later ones at an angle of 50-55 degrees. This observation, however, is based on only a few specimens. The larva inside the case is, therefore, standing almost on its head. In this position it feeds on the leaf, making a small hole through the top layer. It protrudes the fore part of its body through this hole and thus, in effect, mines the leaf without going right inside it.

Coleoptera

Only one beetle depends on the Wayfaring Tree for its existence and this one is also found on the related Guelder Rose. The beetle is *Galerucella viburni* Paykull, of the family Chrysomelidae.

The larvae first appear on the leaves in early May. They are more or less gregarious, three or four feeding on one leaf. They eat holes in the leaves, avoiding the veins and any galls that may be present, and eating from any

part of the surface and not only from the edges as some caterpillars do. The lower leaves and those in shady places are most favoured, but the larvae are by no means confined to such places on the shrub. Usually they are found feeding on the lower surface of the leaf, but are occasionally found on the upper side.

The damage to the leaves attacked is considerable, and if a young shrub is badly infested with the beetle larvae there may be very little useful foliage left by early June. By mid-June the larvae have disappeared from the shrubs and this is early enough in the season for fresh leaves to be produced and make good the damage. The larger shrubs seem to suffer far less than the young ones.

The larva is quite a beautiful object when seen under a low magnification, being bright yellow marked with black. As they grow larger the proportion of black seems to increase so that they appear darker in colour. By early June when they are almost fully grown their length is from 8 to 10 mm.

Pupation takes place in the soil during July and August, and by the end of the latter month the adult beetles have emerged, and are found in considerable numbers on the shrubs, especially the younger ones. They eat the leaves, causing damage very similar to that caused by the larvae earlier in the year.

The beetles were active up to the middle of October. I often saw them in pairs, but in spite of much careful watching in the field I failed to observe the act of oviposition and, therefore, I do not know where the eggs are laid. Some pairs which I kept in pill-boxes did lay eggs, both on leaves and on the sides of the boxes. This was at the end of August and in September. The eggs were yellow in colour, not all of the same shade, oval in shape, 0.5 mm. long and 0.4 mm. wide. One female laid 43 eggs. When viewed under the low power of the microscope the eggs were seen to be not perfectly smooth but covered all over with a network of fine lines making a pattern of hexagons. There would be about 50 of these lines to a millimetre. It is difficult to see whether the lines are raised or depressed, but I think the former. The eggs were also rather irregular in shape.

The adult beetle, on being disturbed, drops straight off the leaf or stem on which it is resting and as there is usually grass or moss or other herbage below it is at once lost to sight. This could very well be a protection against the attacks of insectivorous birds. The beetle, no doubt, has its parasites and predators but the only one of which I have direct evidence is the bug *Troilus luridus*, already mentioned.

Many other beetles were found from time to time on the leaves or stems of the Wayfaring Tree but none were feeding. Some of the predatory ones may have been seeking prey and in this respect *Risophilus atricapillus* L. has already been discussed. Most of the others were taken and identified and a full list will be found in the appendix.

(*To be continued*)

K. C. SIDE (2140).

REFERENCES

3. SWANTON, E. W. 1912, British Plant Galls.
4. MEYRICK, E. 1927, Revised Handbook of British Lepidoptera.
5. FORD, L. T. 1949, Guide to the Smaller British Lepidoptera.

PRACTICAL HINTS — March

On mild evenings larvae may be collected by the light of a torch or vapour lamp. The latter tends to make one's arm ache after an hour or two, but provides a better light. Sheltered lanes, rides in woods, and edges of woods are likely to give better results than open country. Common noctuids will be the bulk of the catch, with a few interesting geometers turning up occasionally; these mainly on the bare twigs or suspended on silken threads therefrom.

Whilst collecting larvae, keep an eye open for imagines which will include *Erannis leucophaearia* Schiff. (Spring Usher), *Theria rupricapraria* Schiff. (Early Moth), *E. progemmaria* Hueb. (Dotted Border), *Selenia bilunaria* Esp. (Early Thorn) and *Earophila badiata* Schiff. (Shoulder Stripe). With the exception of the last two species, these moths have wingless females and a close search of the twigs will be required in order to find them.

Towards the end of the month, light will attract *Biston strataria* Hufn.

(Oak Beauty), *Lycia hirtaria* Cl. (Brindled Beauty), *Phigalia pilosaria* Schiff. (Pale Brindled Beauty) and *Ectropis bistortata* Goeze (The Engrailed). Trunk and fence searching by day will also reveal these species, particuarly the last two.

In areas where birch trees have recently been felled, it may prove profitable to visit such locations after dark, and examine the birch stumps by torchlight. The sap which exudes from these stumps is very attractive to many moths. Large numbers of *Achlya flavicornis* Linn. (Yellow Horned) have been taken by this means when 'sugar' failed completely. Of course, where no such birch stumps exist you may have to use sugar'', but bear in mind that injured trees—broken branches, etc. also 'weep' and may attract insects.

PUPAE. If you have stored your pupae in tins, remove them, or at least the early species, to a breeding cage before any emerge and are ruined before being noticed. Pupae which are being forced indoors require a little thought, too; when frosts are severe ensure that the pupae are not exposed to a sudden drop in temperature because this weakens the moths to such an extent that they may not be able to push their way out of the pupal shell, or if they do, may not expand their wings properly.

. For those who search for pupae the old oak trees should not be overlooked. The dry leaves, which the winds of winter have blown into the angles formed by the roots, should be carefully removed and examined for the boat-shaped cocoons of *Bena prasinana* Linn. (Green Silver Lines). More difficult to find by virtue of its soft silken cocoon covered with particles of earth is that of *Drymonia dodonaea* Schiff. (Marbled Brown). This pupa is very fragile, so any likely looking object should be examined with great care. Whilst searching the roots of oaks, cast an eye over the trunk for odd specimens of *Graptolitha ornitopus* Hufn. (Grey Shoulder Knot). Females will usually deposit ova freely and the larvae are not difficult to rear if given a reasonable amount of room.

Hibernated butterflies will be on the wing this month but should NOT be captured for cabinet specimens. Their condition may not be first class, and it is better to let them get about their business of egg laying and obtain your series later in the year.

R. V. ALDRIDGE (262).

NOTE ON *ECTROPIS BISTORTATA* GOEZE (THE ENGRAILED)

In the early months of the year—April in the North of England, March in the South—it is possible to find specimens of the interesting moth known to-day as *E. bistortata* at rest on the trunks of various kinds of trees. It is worth special attention because of its extreme variation (different districts have different forms), and also because it is often confused with *E. crepuscularia* Hb. In fact, it is very difficult to separate the two species. Some authors doubt if they are distinct species; they may be in the process of becoming different.

It is also one of the species of moths which are prone to melanism under certain conditions. It would be a worthwhile collective group effort to produce an exhibit of series of this species side by side to illustrate the regional variation.

J. H. JOHNSON (1040).

•

AGAPETES GALATHEA LINN. (MARBLED WHITE) IN ESSEX

Most text-books state that *A. galathea* is either very rare, or even extinct in E. Anglia, including the county of Essex.

Last summer a friend of mine brought me a male of this species in a jam-jar. He said that he had often seen them in his garden at his home in South Benfleet, Essex. At first I thought they might possibly be odd stragglers carried over the Thames by the wind; but not being satisfied, I visited Benfleet and discovered that the insect was extremely abundant in the grassy lanes, of which there are many in this district.

A few days later I went to Hackley Woods, near Rayleigh, Essex, to secure a few fritillaries for the cabinet and, to my astonishment, I found a large number of *A. galathea* in a meadow on the outskirts of the wood. They have obviously spread to about six miles inland, unless someone has tried to establish them in this area, which is not likely, as they are too many in number.

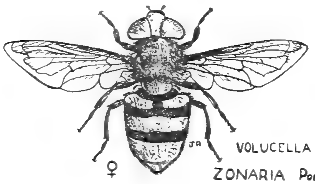
Although this is only a minor invasion, I think, perhaps, that it may have found a foothold in this part of Essex, which I suppose includes Canvey Island, and there are reports of it extending as far East as Leigh-on-Sea.

R. SCOTT (2317).

VOLUCELLA ZONARIA PODA, IN SURREY AND MIDDLESEX

My very first encounter with this most interesting fly was on the 25th August 1946, when I saw a specimen on scabious flowers at Long Wood, Osterley, Middlesex. Three weeks later, on the 15th September I took two females in the same locality. The following summer I again took two females at Long Wood, this time on the 30th August.

An account of these captures, together with a drawing of one of them, and the report of another taken at Northfleet, Kent, on 15th July 1947, by Miss J. Ludlow, was published under the heading of "The Vagrant Fly", by the *Daily Mirror* of 15th October 1947. The Northfleet specimen—a damaged male—is now in my collection.



NATURAL SIZE.

National Service intervened, and I next found myself chasing butterflies all over the North African desert, but when demobilised in January 1950, I took a further two females on 10th September of the same year, and from then onwards saw at least another dozen females flying about the scabious.

The next specimen taken, which was the first living male I had seen, to my surprise came to a lighted window at 10 o'clock at night on the 17th July 1953 at my lodgings in Burlington Avenue, Kew, Surrey, and the following day a female at the same address came to shelter under the overhanging brickwork of a window, immediately prior to a thunderstorm. Two females were caught, and another seen, at Long Wood on the 26th September 1954, and the last specimen of the year I saw on michaelmas daisies in Kew Gardens on 10th October 1954.

I do not know if *V. zonaria* has ever been recorded from hosts other than the hornet, but I believe that wasps must also act in that capacity, for although hornets occurred at Long Wood up to the end of 1950, I have seen none since. The Kew area is fairly extensively built up and I have seen no hornets there. Wasps, however, are very common indeed. And I certainly cannot imagine such a frightening thing as a hornet's nest being allowed to remain for long in Kew Gardens.

JAMES A. RANGER (1002).

•

REVIEW

Handbooks for the Identification of British Insects. Vol. IV, Part 8 (a) Coleoptera, Staphylinidae (part). By C. E. Tottenham. Pp. 79. Price 15/-. Royal Entomological Society of London, November 1954.

This is one of the latest additions to the Royal Entomological Society Handbooks, and is the first of three to cover the extensive family Staphylinidae. It is particularly welcome as the "Staphs" (which in number of species comprise some 25% of our total beetle fauna) have been much neglected owing to difficulties in identification and out-of-date literature, and it is to be hoped that the availability of up-to-date keys in English will stimulate the study of these fascinating insects. The Rev. C. E. Tottenham needs no introduction to coleopterists and the publication of this Handbook at the modest sum of 15/- is, in the opinion of the reviewer, a milestone in the history of British Entomology. With its two companion parts expected soon, it can be regarded as one of the most important taxonomic works on British beetles for at least the last twenty-five years.

The part under review covers the sub-families Piestinae to Euaesthetinae and runs to 79 pages, the first seven of which contain brief notes on habits, collecting technique, distribution, etc. There are 196 figures, of which no less than 49 are of the whole beetle, and although the male genitalia are extensively figured in the difficult genus *Stenus*, the keys themselves rely mainly on upperside external characters. About 250 species are dealt with and it is interesting to note that, except for the addition of numerous species, the nomenclature has remained comparatively stable since Fowler; the nomenclatural changes recently put forward by Blackwelder in the United States (1952) being unacceptable to Tottenham. No serious student of British beetles can afford to be without this book.

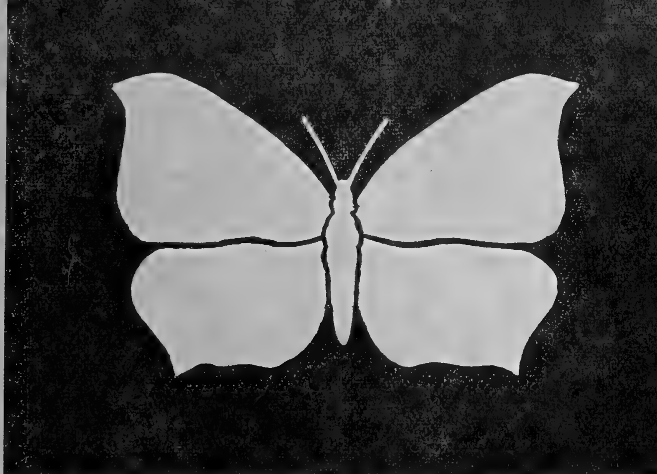
L.S.W.

Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. 1955.

VOL. 14

No. 172

L - - 1955



THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

World List abbreviation : *Bull. amat. Ent. Soc.*

EDITED by B. R. STALLWOOD

AES NOTICE
WHERE TO WRITE

Membership applications, offers of help to: D. OLLEVANT, *3 Salcombe Drive, Morden, Surrey.*

Advertisers to: L. W. SIGGS, *10 Repton Road, Orpington, Kent.*

Changes of address and non-arrival of Bulletins *to:* B. L. J. BYERLEY, *48 Elmgrove Road, Harrow, Middlesex.*

Offers to lead Field Meetings, exhibit, etc., *to:* K. H. BOBE, *19 Hengist Road, London, S.E.12.*

Manuscripts, drawings and books for review to: B. R. STALLWOOD, *19 Southfield Gardens, Strawberry Hill, Twickenham, Middx.*

Subscriptions (12/- per annum, 6/- for Juniors) to: R. W. WATSON, *15 Halstead Road, Bitterne, Southampton.*

Youth matters to: S. M. HANSON, *167 Gunnersbury Park, London, W.5.*

BACK NUMBERS
OF THE
A E S BULLETIN
1s. 3d. a copy

are available from :—

B. L. J. BYERLEY,
48 Elmgrove Road,
HARROW, Middlesex

Complete volumes with covers and index

Volume 7,	1946-8	232 pp.	**21s.**
Volume 8,	1949	96 pp.	**10s. 6d.**
Volume 9,	1950	108 pp.	**10s. 6d.**
Volume 10,	1951	124 pp.	**10s. 6d.**
Volume 11,	1952	116 pp.	**12s. 6d.**
Volume 12,	1953	96 pp.	**12s. 6d.**
Volume 13,	1954	116 pp.	**12s. 6d.**

From

A E S, 1 WEST HAM LANE, LONDON, E.15

A E S BULLETIN
No. 172
APRIL 1955

RETROSPECT ON 1954

From the lepidopterist's point of view the past season must be regarded as a very disappointing one, especially by those who are chiefly interested in butterflies. Only on one occasion was I tempted, by a bright sunny morning, to sally forth to a rather distant habitat of *Lysandra coridon* Poda and by the time I reached my objective clouds had gathered, and it commenced to rain, so my journey was fruitless. However, having reached that age when strenuous field work is apt to prove rather too much of a strain to encourage enthusiasm, I have been content to let breeding cages and the moth trap absorb my interest.

I have been using a Robinson m.v. trap in the Lymington, Hampshire, area during the past three years and have kept daily records detailing wind directions and weather conditions, temperature, moon phases and comparative details of the contents of the trap. These notes have been summarised on charts upon which moon phases, temperatures and number of captures are graphed in three colours. This renders it easy to compare one period with another at a glance. I do not pretend to record the precise numbers of each species visiting the trap. This would be impossible; but I detail the Hawk Moths and the more scarce species.

The two more prevalent Hawk Moths during the past season were *Laothoë populi* Linn. (Poplar Hawk) and *Smerinthus ocellatus* Linn. (Eyed Hawk). 67 of the former appeared between May 1st and August 1st against 36 in 1953, and 35 of the latter between May 9th and July 12th, in contrast to 21 in 1953. There was a slight reduction in the numbers of *Hyloicus pinastri* Linn. (Pine Hawk) and *Deilephila elpenor* Linn. (Elephant) recorded, and considerable one in *Sphinx ligustri* Linn. (Privet Hawk)—13 only, as against 40 in 1953. With regard to species which I regard as scarce in this district many have not appeared at all but there have been one or two striking exceptions, the most surprising to me being the appearance of *Apatele alni* Linn. (Alder Moth). Between May 14th and June 4th I took 9 of this as against one only during 1952 and 1953. In past seasons *Drymonia dodonaea* Schiff. (Marbled Brown) has been scarce and *Drymonia ruficornis* Hufn. (Lunar Marble Brown) abundant, but during this season the former has been far more abundant than the latter, and I have noted many similar instances. I will quote only one. *Lampra fimbriata* Schreb. (Broad Bordered Yellow Underwing), a species which is usually very abundant, has been very much reduced, while *Triphaena janthina* Schiff. (Lesser Broad Bordered) has been far more prevalent than usual.

The very common species, such as *Orthosia gothica* Linn., *Triphaena pronuba* Linn., *Amathes c-nigrum* Linn., and many others have appeared regularly but in reduced quantities, but I have noticed that on isolated occasions one or other of these has appeared in large quantities. I recorded an instance of this with regard to *c-nigrum* (Setaceous Hebrew Character. This has appeared in small quantities—say 12 to 20 per night—since the end of August, but on September 18th I recorded over 200, while other species appeared in very small quantities. These were all very fresh and appeared to be newly emerged. The six days previous to September 18th were warm, but the nights were unfavourable, strong winds and heavy rain prevailing and it was not until September 18th that night conditions were favourable. The natural deduction is that the mild weather was responsible for a large emergence and the moths were on the wing on the first occasion when conditions at night were favourable. This theory, however, must be ruled out by the fact that other species visited the trap in very small quantities on the same night. It would be interesting to know if other members have had a similar experience.

Opinions differ as to what weather conditions are most favourable for the flight of lepidoptera at night, and after studying the question regularly and closely for the past three years, I venture to express my convictions. Many people consider

that wind direction is the chief influence, but I have come to the conclusion that temperature is the primary factor. I have found that whatever the direction of wind few moths appear if the temperature is low. It will be found, of course, that a south-east wind is less productive than one from the south-west, but this, I consider, is due to the fact that the S.E. wind is likely to reduce the temperature. Rough wind and heavy rain I have found unfavourable irrespective of temperature. Reference to the charts I compile shows that the lines of the graph recording degree of temperature and number of insects taken in the trap follow each other regularly in their upward and downward track except during rough weather with heavy rain and wind. Moonlight nights are shown to be unfavourable as a rule, but this does not always apply. On very warm summer nights I have occasionally recorded the contents of the trap as very large when the moon has been "full".

P. Maggs (244).

[Mr. Maggs' conclusions agree in general with those of Dr. C. B. Williams, whose were based on a detailed statistical analysis of the complete results of eight years' light trapping. For full details see:—

1936, *Phil. Trans. Roy. Soc. Lond.* **B 226**: 357.

1939, *Trans. R. ent. Soc. Lond.* **89**: 79; **90**: 227.

Proc. Roy. Soc. **B 138**: 130.

—T. R. E. S.]

INCIDENCE OF ABERRATIONS

During 1954 I captured 196 specimens of *Agrotis exclamationis* L. (Heart and Dart) in my light trap. Of these one was a remarkable aberration which Mr. A. L. Goodson identified as ab. *lineolatus* Tutt. In this moth the familiar black markings appear to have run and been smudged out of shape. Apparently it is not a rare variety, but it is the first time I have ever seen it. Last year I took 440 specimens of *A. exclamationis* in this district with very little variety in the wing markings at all.

The great entomologist H. W. Tutt thought a study of the incidence of aberrations would help to clear up the problems of Natural Selection. Perhaps he was right. Now that the M.V. lamp has made collecting the noctuids so easy, some advance might be made in estimating the importance of aberrations.

J. H. Johnson (1040).

HOW WELL DO YOU KNOW YOUR LEPIDOPTERA?

AN ENTOMOLOGICAL QUIZ

By Joy O. I. Spoczynska (751)

(*Answers on page 36*)

1. Which species was so named by an entomologist who was unable to reach it with his net?
2. What species must never be dropped?
3. Which noctuid's specific name literally means Big-'ead?
4. Scotland Yard should go after this one!
5. One of these would soon get worn out.
6. He might be dusty.
7. How would you like to take this one for a walk on a lead?
8. Mars has two of these.
9. Builders use it.
10. This ought to hit the mark.
11. He probably comes from Berlin.
12. Cook usually has this.
13. You are this if you attend chapel.
14. Should be worn when the sun is strong.
15. What children (and adults) should never be.
16. Many of these are found in the Bible.
17. He's obviously not an office worker.
18. This is said to go well with treacle.
19. This is not so easy to cause to-day as it used to be.
20. Found in heaven.

ENTOMOLOGICAL NOTES FROM WESTER ROSS

When I heard that my work would take me to Loch Maree in the North-West Highlands of Scotland this summer, I looked forward eagerly to getting to know something of the insect natural history of the area. I stayed just outside the village of Kinlochewe, at the south-east end of Loch Maree. Kinlochewe is almost at sea level, but some of the surrounding hills rise to over 3,000 ft.

One of the first moths I saw was the familiar Magpie (*Abraxas grossulariata* Linn.) the larvae of which feed in this area on heather (*Calluna*). The moths were quite numerous in several places (all at lower altitudes and tending to be sheltered by surrounding hills).

Heather sweeping was not usually a very rewarding occupation, but on the 11th July I swept eight smallish black orange-ringed larvae into the net from *Calluna* at about 1,300 feet. Having no idea what they were I took them back for rearing out. Soon they moulted and displayed their true colours — I had failed to recognise the early stages of the Emperor Moth (*Saturnia pavonia* Linn.). At the same time at lower altitudes Emperor Moths were in their penultimate or last instars. On a day's ramble I would generally come across one or two without specially looking for them. During July fully-fed caterpillars of the Northern Eggar (*Lasiocampa quercus* Linn. var. *callunae*) were fairly common, . too. As mentioned above, heather sweeping was not usually productive, except of bugs. However, several Geometrid larvae were obtained in this way (now over-wintering pupae) and a few adults of the Narrow-Winged Pug (*Eupithecia nanata* Hb.). Spun-up heads of Bog Myrtle (*Myrica gale* L.) were patiently examined for larvae of the Argent and Sable (*Eulype hastata* Linn.) but *Tortrix* caterpillars were the usual inhabitants of these cocoons.

Isolated sallow bushes provided good hunting for larvae. The Puss (*Cerura vinula* Linn.) was the commonest species and larvae of all stages were sometimes found on a single bush. The Knotgrass (*Apatele rumicis* Linn.) and Light Knotgrass (*A. menyanthidis* View.) caterpillars were also found on sallow. Three large green ova found on the same plant hatched into Hawk-moth larvae but they died without feeding (perhaps the Poplar-hawk would be the only hawk found so far north?)

Moths sometimes turn up in odd places. The bathroom was productive of Antler Moths (*Cerapteryx graminis* Linn.), attracted by the Tilley light, but this was the only species that I captured in this manner. My best find of the visit was discovered on the garage floor—a beautiful dark velvety Noctuid which was afterwards identified as a fine dark form of the Dark Brocade (*Eumichtis adusta* Esp.). Sometimes a single species would be found in great numbers. One July day I disturbed hundreds of the Common Carpet (*Epirrhoë alternata* Muell.) by walking through bracken. On several evenings in August in heather clearings in a pine wood the Twin Spot Carpet (*Colostygia didymata* Linn.) was found in similar numbers. Eggs obtained from a copulated female are overwintering.

Butterflies were uncommon; probably the poor, sun-less weather was to blame. Green-veined Whites (*Pieris napi* Linn.) were seen in marshy places and the Small Heath (*Coenonympha pamphilus* Linn.) on the moorland. Small Tortoiseshells (*Aglais urticae* Linn.) bred on a clump of nettles by a byre. A Large Heath (*Coenonympha tullia* Muell.) was the most interesting butterfly to note.

Barbara A. Hopkins (827).

AN ABERRATION OF *LITHOMOIA SOLIDAGINIS* HB. (GOLDEN ROD BRINDLE)

Towards the end of the summer of 1954 there appeared to be a widespread migration of *L. solidaginis* from Germany to this country. Specimens were taken in m.v. light traps in Essex, Surrey, Middlesex and Hertfordshire, where the species is never found in ordinary years. Those recorded in the journals were chiefly referable to the ab. *cinerascens* Stgr. which is a blue-grey form. On August 27th, 1954, I took an almost black specimen of *L. solidaginis* in my m.v. light trap. It was quite different from the usual type of this moth which I find commonly on the Derbyshire moors. I sent it to Mr. A. L. Goodson of Tring Natural History Museum, and he identified it as ab. *rangnowi* Stichel, which was not hitherto represented in the British Museum. It would be interesting to find out if any other collector took this form in England, in this, or any other season.

J. H. Johnson (1040).

OBITUARY

Many members will hear with great regret of the death at Staines, Middlesex, of Mr. Alfred J. Laurance, the well-known entomologist and composer of songs. In his lifetime he had collected for Lord Rothschild in New Guinea, and other far places. I have it on his own authority that he was primarily responsible for the discovery that *Polychrisia moneta* Fab. could be found on the garden Delphinium, many years ago.

As well as abroad, he had collected all over the British Isles, and told me that one of his greatest thrills was finding *Poecilopsis lapponaria* Boisd. by torchlight in Perthshire. His death is a great loss to entomology and music.

J. C. Nott (1913).

A STUDY OF THE INSECTS LIVING ON THE WAYFARING TREE (4)

(Continued from page 22)

INSECTS WHICH FEED UPON THE POLLEN

Pollen is an important source of food for many insects, and the Wayfaring Tree provides an abundant supply of it. Many small insects are attracted to this food, and some of them in their wanderings amid the flowers carry pollen from the stamens to the stigmas.

The flowers begin to open during the last week of April and are almost all withered by the end of May. The period of the most abundant pollen is the first three weeks of May. During this period I made observations of the insects which visited the flowers by day. I watched for long periods of time, but saw very few flying insects come to the flowers in spite of their being very conspicuous, massed closely together as they are, and in spite of their rather strong scent. The few that did come were small bees, some of the parasitic hymenoptera and various diptera. I was unable to make any night observations and it is possible that results after dark might be different.

Although few of the larger insects visited the inflorescences, there were plenty of smaller ones crawling about amongst the individual flowers. These were nearly all out of sight when viewed from either the front or back of the inflorescence. However, I was able to obtain them by shaking the whole inflorescence over a sweep-net.

On three days in May 1952, I made a careful collection of all the insects on a number of inflorescences from four different localities. This collection consisted of:—

Collembola	4
Dermaptera	
Forficula auricularia L.	4
Thysanoptera	6
Hemiptera-Heteroptera	4
Hemiptera-Homoptera	
Aphididae	15
Lepidoptera (larva)	1
Coleoptera	
Cantharis nigricans Mueller	1
Agriotes acuminatus Stephens	1
Byturus tomentosus Degeer	22
Meligethes spp.	62
Epuraea spp.	8
Cryptophagus sp.	1
Corticarina gibbosa Herbst	4
Psyllobora 22-punctata L.	1
Anaspis rufilabris Gyllenhal and *A. frontalis* L.	15
Anaspis maculata Fourcroy	34
Melolontha melolontha L.	1
Longitarsus sp.	1
Apion sp.	1
Polydrusus cervinus L.	1
Balanobius pyrrhoceras Marsham	2
Hymenoptera	
Parasitica	1
Myrmica ruginodis Nylander	6
Lasius niger L.	11
Andrena sp.	1
Diptera	6

There were also 8 spiders.

In 1953 I made a larger collection under similar circumstances. Dr. A. M. Easton kindly agreed to identify the *Meligethes* beetles for me and in the list which follows I have used his names in preference to those given in Kloet and Hincks. Where the latter are different I have put them in brackets. The insects were taken from a number of inflorescences selected at random from three different localities:—

Collembola	22
Thysanoptera	43
Hemiptera-Heteroptera (nymph)	1
Coleoptera	
Metacantharis clypeata Illiger	1
Agriotes acuminatus Stephens	3
Byturus tomentosus Degeer	6
Meligethes atratus Olivier	2
M. aeneus Fabricius	195
M. viridescens Fabricius	19
M. erythrops Gyllenhal	30
M. flavimanus Stephens (*M. lumbaris* Sturm)	3
M. nigrescens Stephens (*M. picipes* Sturm)	23
Epuraea melina Sturm	23
E. deleta Sturm	4
Cryptophagus sp.	1
Corticarina gibbosa Herbst	15
Adalia decempunctata L.	2
Coccinella septempunctata L.	1
Anaspis rufilabris Gyllenhal and *A. frontalis* L.	80
Anaspis maculata Fourcroy	13
Aphthona euphorbiae Schrank	3
Phyllobius pyri L.	1
Anthonomus rubi Herbst	2
Hymenoptera	
Formicidae	17
Apidae	2
Parasitica	1
Diptera	34

There were also 10 spiders.

Taking into consideration the counts made in both seasons it will be seen that most of the insects found amongst the flowers are beetles, the most important ones being the three species of *Anaspis*, the several species of *Meligethes*, *Byturus tomentosus* and *Corticarina gibbosa*. In the above lists I have put together the numbers of *Anaspis rufilabris* and *A. frontalis*. These two species are very much alike and at first I thought they were all the former species, but on more careful examination later I found some specimens of *Anaspis frontalis* among them and as I had not kept the complete sample it was then impossible to say exactly how many of each species there were.

The beetles mentioned in the previous paragraph visit the flowers in order to feed on the pollen and while doing so they probably serve the plant by pollinating the flowers. This is difficult to prove but there is circumstantial evidence in the fact that pollen grains were frequently seen adhering to the insects after they had been captured on the flowers.

Clapham, Tutin and Warburg (1952) state that the flowers are not only insect-pollinated, but also sometimes self-pollinated. Other notes on the pollination of *Viburnum lantana* are given by P. Knuth (1908). They are:—

Schulz .... Numerous flies, Hymenoptera and Beetles.
Loew .... *Bibio laniger* Meigen (Diptera: Bibionidae).
Kohl .... *Leconotus rossii* (Not in Check-list).
Von Dalla Torre and Schletterer ...... *Bombus pomorum* Panzer (Hym: Apidae).

The observations on which these notes are based were not made in this country and, except for Schulz, they do not agree with my findings. My own observations would lead me to say that the flowers are pollinated by beetles, flies and Hymenoptera in that order. Thrips and insects of other orders may also help to a lesser extent.

The insects that occur in ones and twos in the above tables are probably accidental visitors which normally live and feed elsewhere. They are not of great significance in this study, although a few are predators and would feed on any suitable prey they might find while temporarily present on the flowers.

It is interesting to note that towards the end of the flowering season, when there was less pollen to be obtained, the numbers of insects present on the flowers showed a marked decrease. This is particularly true of the beetles. I believe that these insects pass on to other shrubs which flower later. The order of succession of the flowering shrubs of the chalk is roughly Blackthorn, Wayfaring Tree, Hawthorn, Whitebeam, Elder, Rose, Privet, Dogwood, Buckthorn, Bramble and Spindle. There is a good deal of overlapping especially at the height of the summer, when several of these are in bloom at the same time. I did not have time to investigate the insect populations of all these flowers, but I did note *Byturus tomentosus*, the *Anaspis* species and some of the *Meligethes* species on hawthorn, elder, rose and bramble.

INSECTS WHICH FEED AT THE RIPE FRUITS

The fruits of the Wayfaring Tree are formed quite early in the year, but it is not until they turn black and become soft and juicy, that they attract insects. About the beginning of August there are usually red and black fruits present together, but the insects feed only at the ripe ones. From the middle of August to the middle of September the fruits were visited by insects of various kinds. They were mostly Diptera, some Hymenoptera and a few insects of other orders.

Of the flies I have been able to identify only a few of the very many species that I saw. These are listed in the appendix. The commonest of the Hymenoptera were wasps. I took quite a lot of these to identify, and was rather surprised to find that every one was *Vespula vulgaris* L. in spite of the fact that *V. germanica* Fabricius is almost as common in Kent. I cannot believe that other species of *Vespula* would not feed at the juice of these fruits but I did not see any. Ants also were often to be seen on the ripe fruits.

The majority of the fruit-feeders were active only when the sun was shining. This was particularly noticeable on cool cloudy days with an occasional burst of sunshine. Whenever the clouds obscured the sun most of the insects would cease feeding. During the dull periods the Diptera especially would rest on the foliage in a very torpid state, but as soon as the sun shone again they became active and the bunches of ripe fruits were once more the scenes of busy feeding.

Although it is not closely connected with insect ecology, it is of some interest to note that I found evidence of birds eating the fruits of the Wayfaring

Tree, not by actual observation, but from the birds' droppings. I could never see any birds feeding on the shrub and I do not think the fruits are as important to the birds as many others of our wild berries, possibly because they are ready when there is plenty of other food about.

By the end of September the fruits have withered and become dry. Some remain on the branches until late in November but they are no longer attractive to insects and I have no records of feeding after September. The flies and wasps possibly transfer their attentions to the fruits of the bramble and the blossoms of the ivy, for these have insect visitors to a much later date in the autumn.

REFUSE FEEDERS

Many of the insects encountered on the Wayfaring Tree were scavengers feeding on dead and decaying plant and animal remains. It is unlikely that insects with these feeding habits would be attached to any particular plant and those mentioned here are also found in many other situations where there is a similar source of food.

The refuse material to be found on the Wayfaring Tree consists of:—

(i) Dead and decaying parts of the shrub itself.
(ii) Cast skins of the insects and spiders which live on the shrub.
(iii) Insects and other animals which have died there.
(iv) Honeydew voided on to the leaves and shoots by aphids.
(v) Excrement of insects, especially of lepidopterous larvae, and occasionally birds' droppings.

The empty curl-galls, empty leaf-mines and pockets in leaves made by the larvae of the moth *Peronea schalleriana* frequently contained insects, mites and woodlice. Many of these were there to feed on the refuse present although others may have been nocturnal feeders sheltering during the day.

Springtails (Collembola) were the most numerous of the insects found in these places and they occurred all through the summer. I have not been able to identify any of these. Most of the other insects which come into this category are small beetles. One, *Corticarina gibbosa* Herbst, has already been mentioned as occurring on the flowers. Two others which were not found so often were *Olibrus corticalis* Panzer and a species of *Cryptophagus*. Earwigs, *Forficula auricularia* L., were very frequently found in the curled leaves. They were of all the different instars except the first and I think there is very little doubt that they use these sites as places of shelter, not only from daylight which they normally shun, but also at the times when they are shedding their skins and are more vulnerable to their predators. On one occasion I found an earwig, which had just shed its skin, inside one of the curl-galls. The insect was pure white in colour and its cast skin was there beside it. It would, of course, assume its natural colour after a day or so. In addition to this I often found in similar places the cast skins of earwigs and other insects, and of spiders, the last being the most frequent.

The earwigs feed at night not only on refuse material but also on parts of the living plant.

The Scorpion-fly *Panorpa communis* L. (Mecoptera: Panorpidae) was quite common from June to September, and should be mentioned here among the scavengers. It is usually considered to be carnivorous, but it seems to feed on dead insects in preference to living ones. I did not at any time see it actually feeding.

Animals other than insects which were found in circumstances suggesting that they might be scavengers, were the mites found in curl-galls in July and the woodlice *Porcellio scaber* Latreille and *Armadillidium vulgare* Latreille.

OCCASIONAL AND ACCIDENTAL VISITORS

The insects that occur casually or accidentally on the Wayfaring Tree are very numerous both in individuals and species but are not very important ecologically. Almost any insect which lives in the habitat and whose habits take it off the ground either by flight, or by walking up the trunk and branches, is liable to be found on the shrub. Such visitors may be merely resting or they may take any opportunity of feeding that is offered while they are there. They may also themselves fall a prey to any predator that may be present.

Some may use the leaves and branches as jumping-off places in their hunting for food as was the case with the Robber-fly (Diptera: Asilidae) which I saw eating another fly and using a leaf of the shrub as a feeding place.

Some of the nocturnal insects which shelter in the curl-galls, and other places, may do so because these are very suitable hiding places and at night

they may wander off the Wayfaring Tree altogether.

Many of the insects enumerated in the appendix are of accidental occurrence, being either more usually found on other plants which grow in the chalk scrub habitat, or found in a wide variety of situations.

I have not found any insects hibernating on the shrub, and I do not think that many do so. The bark is smooth and there are no suitable places for an insect to pass the winter. However, such places could occur by accident, as for instance where a branch had broken off and a cavity formed at the point of breakage. In such a place as this I found the stem of a low shrub hollow for about five inches below a point where a leaf had been removed. Inside the cavity were seven cells one above the other, each containing a pupa. I found these on August 25th, 1952, and took away the stem containing them in order to investigate what they were. The top cell was damaged when I tried to find out if the cells contained living insects, but the rest were kept through the winter in a jam-jar.

On June 14th, 1953, I noticed that six small black wasps had emerged. They proved to be *Trypoxylon clavicerum* Lepeletier and they must have emerged not long before the date given as they were still alive then.

According to E. Step (1932) bramble stems are favoured by this wasp for the placing of its cells, and the food supplied by the mother for the nourishment of the grubs consists of spiders. These could have been obtained from anywhere in the locality and not necessarily from the Wayfaring Tree. The occurrence of this wasp's cells is not of any great importance in the ecology of the insect community we are considering, but it serves to show how insects can take advantage of accidental situations that suit their purpose.

K. C. Side (2140).

(*To be continued*)

REFERENCES

6. Clapham, A. R., Tutin, T. G., and Warburg, E. F. 1952, Flora of the British Isles.
7. Knuth, P. 1908, Handbook of Flower Pollination.
8. Step, E. 1932, Bees, Wasps, Ants and Allied Insects of the British Isles.

PRACTICAL HINTS — April

Continue larva-collecting as during March, but extend your search to the bursting buds of Hawthorn, Sallow, etc. *Bombycia viminalis* Fab. (Minor Shoulder-knot) starts its life inside sallow shoots, whilst that of *Polia tincta* Brahm (Silvery Arches) is usually found on the lower branches sampling the tender leaves, in company with *P. nebulosa* Hufn. which it closely resembles. The latter species has more prominent diamond-shaped marks on the back and is more heavily marked on the sides. *Nudaria mundana* Linn. (Muslin Footman) larvae may sometimes be found on lichens growing on old walls and trees.

Those possessed with time, good eyesight, and patience may care to search for ova of *Ptilophora plumigera* Schiff. (Plumed Prominent) on or near the buds of Maple growing in hedges.

During the first fortnight beat Scots Pine and Larch for larvae of *Ellopia prosapiaria* Linn. (Barred Red). Whilst doing this keep an eye open for pupae of *Thera firmata* Hb. (Pine Carpet) which may fall from their cocoons to the beating tray. Pupae of *Plagodis dolabraria* Linn. (Scorched Wing) are to be found under moss on Beech and Ash.

"Sugar" may be tried on suitable occasions, but Light will attract the majority of specimens. If the night is cold, select the most sheltered place to set up your lamp. Well inside a wood, an open spot amid gorse bushes, etc., or if nothing better is possible, the most sheltered corner of a field.

Towards the end of the month, light may attract *Colocasia coryli* Linn. (Nut-tree Tussock) which is common in its beechwood localities, *Panolis flammea* Schiff. (Pine Beauty), *Gypsitea leucographa* Schiff. (White Marked) and *Cerastis rubricosa* Schiff. (Red Chestnut). These last two species will be out in late March to early April in a normal season (rare in recent years!). *Coenotephria derivata* Schiff. (The Streamer) may come to light or may be searched for by torchlight in the vicinity of Wild Rose bushes.

Keep an eye on the Sallows and as soon as the male catkins show signs of yellow, visit them nightly. There are several methods of collecting. My preference is to thrust a beating tray

under the bush, then examine the catkins by torchlight, and select any desired specimens. Next, shake the boughs over the tray and examine the contents.

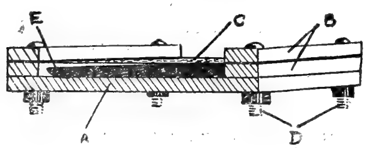
During the last week in April collect *female* sallow catkins (those which do not have yellow anthers, and look like minature fir cones opened out). A goodly quantity collected from each of several localities, and labelled, should be placed in a roomy box, covered with gauze and stored in a fairly cool place. Each night examine the contents carefully: if you have been lucky you will see minute larvae crawling about. Remove these on a camel hair paintbrush to a glass-topped tin containing fresh catkins. As they get larger offer young sallow leaves. Transfer to a larger breeding cage with sprays of foodplant when they are about ½″ long. One species commonly obtained by this method is *Cirrhia fulvago* Linn. (The Sallow).

R. V. Aldridge (262).

A DEVICE FOR FEEDING CAPTIVE BUTTERFLIES

For the interest of members I would like to describe and explain how to make a device which I have been using quite successfully now for several years for feeding butterflies in captivity.

It consists of (A) one sheet 4″ × 4″ perspex for a base, (B) four strips of the same material 4″ × ¾″ × ⅛″, (C) a sheet of perforated zinc 4″ × 4″, (D) four $1\frac{3}{16}$″ bolts with nuts and (E) a 3½″ × 3½″ sheet of zinc NOT perforated.



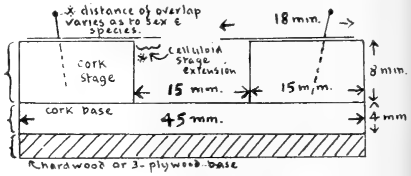
The perforated zinc by being bolted between (B) is suspended ⅛″ above (A), leaving a gap for (E), this being a piece of flat zinc hammered into a shallow tray. The tray into which the liquid food is poured, is slid between the base and the perforated zinc, on which the butterfly stands putting its proboscis through the holes in the zinc; it can then feed without the chance of getting stuck to the food. The finished article can be bolted at right angles to the side of the cage.

T. J. Rutty (2114*).

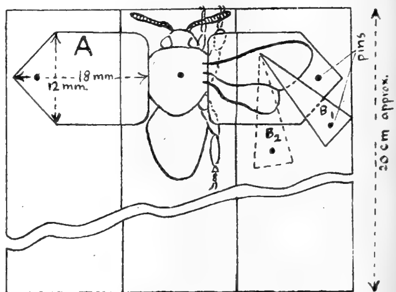
A SETTING BOARD FOR THE LARGER HYMENOPTERA

I have not found the "Setting-board for Bumble Bees" (*Hymenopterist's Handbook*, p. 90) entirely satisfactory. I intend here to describe my modification of it, including details for the benefit of amateur hymenopterists not possessing the above handbook.*

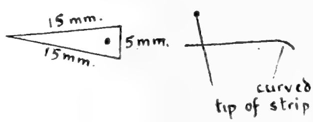
Material required: Sheet cork (3 or 4 mm. thickness); hardboard or 3-ply-wood; celluloid strips (thinner the better); glue, paper and paste; short thick pins; cardboard (strips).



Diag. 1. Cross-section



Diag. 2. Plan. (only right legs & wings shown)



Diag 3. Plan and edge views of cardboard strips.

Construction: Cut a piece of hardboard (or 3-ply-wood) 20 × 4·5 cms. This will be the base (see diag. 1). A piece of cork of matching size should be glued to the upper side of this, to receive and hold the mounting pins. Then cut four strips of sheet cork 20 × 1·5 cms. Take two of these strips, and glue on to the base as illustrated, leaving a groove 1·5 cms. across. When the glue has dried, stick the remaining strips in place on top of the first pair. A clean and neat finish can be obtained by pasting paper either completely over the cork and in the groove, or just on

the surface layers of the cork, upon which the bee—or wasp—wings will eventually rest. This is of course optional, for I have found that merely coating the whole 'board with white gloss paint is quite practicable.

Now, I will consider what I think to be the main improvement on this type of 'board, the 'wing-stage-extensions'. Cut a dozen or more celluloid polygons (see diag. 2 for dimensions). A short stout pin is now pushed half its length through the point indicated on each polygon. About a score of cardboard 'triangular strips' are cut out, 15 × 15 × 5 mms., for securing the wings as mentioned later (see diag. 3). The measurements I have suggested are suitable for a setting-board for the Bombidae, larger Vespidae and Symphyta, etc., and may be modified for different families and so on.

MOUNTING TECHNIQUE: Mount your specimen in the groove in the usual way with a pin through the thorax, and arrange the legs and antennae as illustrated. Then place the wing-stage-extensions so that they overlap the edge of the wing-stage by about 3 mms. (i.e. to the base of the wings). The wings can now be arranged upon the 'extensions, and secured in the required positions by the cardboard strips. The main idea of the 'extensions is for the purpose of having the entire wings resting on a flat surface.

I have found that by using the setting-board described in the *Hymenopterist's Handbook*, only the distal halves of the fore-wings and the tips of the hind-wings reach the wing-stages. This arrangement often causes the wings to become torn when attempting to secure them. When the entire wings are on my wing-stage-extensions there is more surface-friction, so that little pressure is needed by the cardboard strips to hold them in their positions. In fact one small triangle of stiff cardboard is quite sufficient for each pair of wings. This setting-board can furnish eight or ten average sized Bombidae. I hope to deal with the setting of micro-Hymenoptera in a later article. B. W. BLACKWELL (1720).

[*Unfortunately now out of print. —Ed.]

●

INSECTS IN A COALMINE

Further to my previous article on insects found in a Derbyshire coalmine in 1953 (*Bull. amat. Ent. Soc.*, **13**: 22), the following is a list of moths, etc., taken during 1954, with dates of capture and numbers caught. All the moths and the beetle were caught between 10.30 p.m. and 11.45 p.m., the woodwasp at 2.45 a.m., 2 miles from the shaft bottom.

Date	Species	No.
Apr. 15	*Orthosia gothica* Linn. (Hebrew Character)	1
May 27	*Melolontha melolontha* Linn. (Cockchafer)	1
June 10	*Spilosoma lubricipeda* Linn. (White Ermine)	1
,, 18	*S. lubricipeda* Linn. (White Ermine)	2
,, 18	*Laothoë populi* Linn. (Poplar Hawk)	1
,, 18	*Platyptilia gonodactyla* Schiff. (Triangle-marked Plume)	1
,, 21	*Deilephila elpenor* Linn. (Elephant Hawk)	1
,, 25	*Smerinthus ocellatus* Linn. (Eyed Hawk)	1
July 6	*Plusia v-aureum* Hb. (Beautiful Golden Y)	1
,, 8	*Hepialus humuli* Linn. (Ghost Swift)	2 ♀
,, 11	*Heliophobus saponariae* Esp. (Bordered Gothic)	1
,, 20	*Agrotis segetum* Schiff. (Turnip Moth)	1
,, 24	*Arctia caja* Linn. (Garden Tiger)	1
,, 26	*Leucania impura* Hueb. (Smoky Wainscot)	5
,, 26	*Xanthorhoë ferrugata* Clerck (Twin Spot Carpet)	1
,, 28	*Amathes c-nigrum* Linn. (Setaceous Hebrew Character)	1
Aug. 4	*L. populi* (Poplar Hawk)	1
,, 4	*Plusia chrysitis* Linn. (Burnished Brass)	1
,, 5	*Pelurga comitata* Linn. (Dark Spinach)	1
,, 6	*Urocerus gigas* Linn. (Wood Wasp)	1
,, 6	*Apamea lithoxylea* Fabr. (Light Arches)	1
,, 13	*Leucania lithargyria* Esp. (Clay Wainscot)	1
,, 24	*Notarcha ruralis* Scop. (Mother of Pearl)	1
,, 25	*Sterrha aversata* Linn. (Ribband Wave)	1
,, 27	*Plusia gamma* Linn. (Silver Y)	4
,, 27	*N. ruralis* (Mother of Pearl)	1
,, 27	*Leucania pallens* Linn. (Common Wainscot)	1
,, 27	*Euproctis chrysorrhoea* Linn. (Gold Tail)	1
,, 28	*N. ruralis* (Mother of Pearl)	1
,, 29	*E. chrysorrhoea* (Gold Tail)	2
,, 30	*Tholera popularis* Fabr. (Feathered Gothic)	1
Sept. 1	*Hadena trifolii* Rott. (Small Nutmeg)	1
,, 11	*Epirrhoë alternata* Muell. (Common Bedstraw Carpet)	2

,, 11 *P. gonodactyla* (Triangle marked Plume) 1
,, 15 *Anchoscelis litura* Linn. (Brown Spot Chestnut) 1
,, 15 *Dysstroma atrata* Linn. (Dark Marbled Carpet) 2

W. Bilbie (1679).

NOTES ON RECORDING LIGHT-TRAP CAPTURES

I believe that there is some misunderstanding about my meaning in the note on the use of a light trap in *Bull. amat. Ent. Soc.*, **13**, 76, or so it would appear from certain letters which I have received. I stated there that for work with a light trap to be of the greatest value a *complete* record of *all* the insects captured should be made, not just a list of species which occur. Such a list may have had value at one time, but not so today.

There are various ways of maintaining a record. An ordinary exercise book may be used, and a list of every moth written down under the date in which it was taken from the trap. This is easy to organize, but the names are written down dozens of times, and it is extremely tedious to total up the catch at the end of the season. I have found that the most convenient plan is to take a large sheet of drawing paper and mark it off in pencil into quarter inch squares, by means of drawing board and T-square, for the sake of neatness, in the manner of graph paper. (It is possible to obtain paper printed in this way from some manufacturers.) For the sake of easy access it is a good idea to pin the sheet on a vertical wall (bedroom, study or shed). Then the names of all the moths expected in the trap should be written neatly down the left hand side of the paper, following some standard system of nomenclature, e.g. Kloet and Hincks, W. H. Tams, I. R. Heslop or even R. South, if that is the only available work. Along the top the squares should be marked off as dates on which the trap is used. It will be perceived that if two hundred moths are expected and the trap is going to be run for two hundred nights a large area of paper will be needed. Several sheets may have to be joined together or superimposed in the manner of school registers.

When the chart is prepared the daily catch may be entered up in the appropriate squares corresponding horizontally with the species, and vertically with the date. It is convenient to enter up the catch as the trap is emptied.

At first glance this system may seem unwieldy, but for observing first and last appearances, and totals, it is excellent. It also makes it obvious which species are double-brooded without much turning of pages.

At the same time another book should be maintained in which a detailed account of the specific variation or aberration if two or more are found in the district may be entered up. In this case a separate page is required for each species, and probably a loose-leaved notebook would be most convenient where common species are concerned. Here for an example is a typical page (the details of the trap are given on the cover of the book).

GONODONTUS BIDENTATA Cl.
(Scalloped Hazel)

1954							
May	11	2	typical				
,,	13	1	,,				
,,	16	1	,,				
,,	24	2	,,		1	melanic	♀
,,	26	3	,,		3	,,	
,,	27	8	,,		1	,,	
,,	28	7	,,				
,,	29	7	,,		1	,,	♀
,,	30	12	,,	1♀	1	,,	
,,	31	2	,,				
June	3				1	,,	
,,	5				1	,,	♀
,,	7	6	,,				
,,	8	2	,,				
,,	9	1	,,				
Total		54	typical		9	melanic	

This sheet gives the ratio of melanic *bidentata* to typical, at a glance, so that comparison may be made with other years or places.

The incidence of melanism is very interesting. It may be dominant as in the case of the Peppered Moth (*Biston betularia* L.) or it may not. Here careful accurate records will help, if they are made available to the persons who are working on the problem.

J. H. Johnson (1040).

PALE TUSSOCK COCOONS

Having never seen the following observation in print I should like to record it for the benefit of those interested.

A larva of *Dasychira pudibunda* Linn. (Pale Tussock) has just pupated in my cages, and for the first time

I noticed that its cocoon is not just a simple sac. The pupa itself—together, of course, with the cast larval skin—*is* enclosed within just such a simple, sac-like envelope made of silk interwoven with bristles from the larval "shaving-brushes"—the dorsal tufts. This sac, which is very closely woven, is suspended, free of the sides, within a *second* silken sac, in which there are no bristles and which is much more openly woven, though distinct.

The inner cocoon is suspended by a very loose network of criss-crossing, single strands of silk passing across the space between the two envelopes in all directions, and the outer one is suspended from the supporting walls of the cage by quite a small number of compound silken "guy-ropes".

Presumably the inner, closely-woven cocoon prevents too much loss of moisture and acts as a final deterrent to predators, in which it is assisted by the enclosed bristles; the loose suspension between the two layers acts as a shock-absorber guarding against jarring of boughs by wind or the passage of large animals; the thin outer cocoon acts as a basis for this, and as a primary deterrent for predators; and the strong guy-ropes anchor the whole structure in place.

A regular "feather-bed pupa"! Or, to change the metaphor, I wonder whether next year's model will have independent suspension of all segments!

PETER G. TAYLOR (719).

ALTERNATIVE FOODPLANTS OF THE LIME HAWKMOTH

Upon at least six occasions in Merton Park, London, at the end of May 1954, I noticed a freshly emerged imago of *Dilina tiliae* Linn. near the front garden gate, and at the end of July, I nearly trod on a full-fed larva wandering to pupate. Nothing unusual, perhaps, but the nearest Lime or Elm trees are about a mile distant, with pavements between all the way. About two yards away are two Wild Cherry trees, and the only other possible (?) food plant adjacent is Lilac.

As freshly emerged imagines do not have to crawl far for convenient drying positions, the assumption would be that they came from the Wild Cherry trees, were it not for the fact that the soil underneath is almost conspicuous by its absence. Have other members any similar case to report, or any other possible explanation?

J. C. NOTT (1913).

[P. B. M. Allan, 1949, *Larval Foodplants*, gives Alder, Birch and Hazel, in addition to Lime and Elm. —Ed.]

BEETLES AT LIGHT

During 1954, Mr. L. W. Siggs (243), kindly gave me the beetles which came to the m.v. lamp in his garden at Orpington, Kent. The lamp is one of 80 w., and is placed on a sheet on the lawn. All the specimens captured came to the light at dusk, when it was first lit, and none came later. It is, therefore, not surprising that the species listed below are diurnal and crepuscular insects, as far as their habits are known.

CARABIDAE — *Harpalus zigzag* Costa: 1 ♀, 30.8.1954; *Bradycellus verbasci* Duftschmid: 2, 24.7.1954; 5, 30.8.1954; *Amara apricaria* Paykull: 1 ♀, 24.7.1954; 1 ♂, 30.8.1954; *Amara consularis* Duftschmid: 1 ♂, 27.8.1954.

SCARABAEIDAE — *Aphodius rufipes* Linnaeus: 1, 19.6.1954; 1, 24.7.1954; 1, 27.8.1954; *A. rufescens* Fabricius: 1, 24.7.1954; *Amphimallon solstitialis* Linnaeus: 1 ♀, 20.7.1954.

ANISOTOMIDAE — *Leiodes calcarata* Erichson: 1, 26.6.1954.

HELODIDAE — *Prionocyphon* sp. (? *serricornis* Mellié): 1, 9.9.1954.

CANTHARIDAE — *Rhagonycha translucida* Kryn.: 1 ♂, 1 ♀, 26.6.1954; *R. fulva* Scopoli: 1, 24.7.1954.

ELATERIDAE — *Melanotus rufipes* Herbst: 1, 19.6.1954.

CURCULIONIDAE—*Otiorrhynchus sulcatus* Fabricius: 1, 24.7.1954; *Sitona flavescens* Marsham: 1, 26.6.1954.

My thanks are due to Mr. A. J. Roudier (1924), who kindly identified *Sitona flavescens*; it was an immature specimen, which, he says, probably had only recently emerged from the pupa.

I must confess to being the anonymous exhibitor of these specimens mentioned in the report of the Annual Exhibition (*antea*, p. 1): the label must have got lost during the afternoon.

E. LEWIS (952).

THE STUDY OF VARIATION CAUSED BY DIFFERENT FOODPLANTS

For those members who are not solely concerned with acquiring a series of every species of lepidoptera on the British List, but who regard their hobby as rather more than collecting postage stamps, I would

like to make a note of a few paragraphs written by H. M. Vernon in *Variation in Animals and Plants* (1903). In these he gives a list of examples of variation in various species of lepidoptera, caused by feeding the larvae on foodplants of widely separated genera (p. 289). Many breeders of insects have noticed this phenomenon in a desultory sort of way; I have noticed that if several generations of larvae of the Garden Tiger Moth (*Arctia caia* L.) are fed on dock they deteriorate in size, and the imagines are duller, and contain far more dark brown in their wing colours, than those fed on nettle, which seems to suit them best. There is room for much more serious work in this field.

Some method of measuring variation in colour and pattern must be devised so that it may be subjected to statistical treatment, if the maximum value is to be obtained for the labour involved.

J. H. Johnson (1040).

[See *Bull. amat. Ent. Soc.*, **10**: 102; **12**: 28.—Ed.]

LETTERS TO THE EDITOR

THE SMALL TORTOISESHELL IN DECEMBER

G. E. Jenner (2438) writes:—

Members may be interested to know that on the 28th December 1954 I caught a specimen of *Aglais urticae* Linn. flying round some late chrysanthemum flowers.

Maximum temperature readings taken from Brenchly Gardens, Maidstone, Kent, a short distance from my own garden, where the insect was taken, did not exceed 54° F. on the 28th and 52° F. on the two previous days, there being no sunshine at all over the three-day period.

MUTILLA EUROPAEA LINN.

From W. G. C. Booker (1742):—

I was interested in the article by Mr. E. Lewis (*Bull amat. Ent. Soc.*, **14**, 6), recording *Mutilla europaea*, etc., on an ants' nest at Studland, Dorset.

I found a female of this species in Surrey on the trunk of a peach-tree which was covered with aphides and ants, in 1950. In 1953 I came across another female *M. europaea* also close to a nest of garden ants. I wonder if this, too, was accidental, or do the ants attract them in some way?

THE TOADFLAX BROCADE

G. H. W. Cruttwell (118) writes:—

I don't often put pen to paper, which task I am afraid that I generally leave to others, but I feel that I must write to say how thoroughly I agree with Mr. Aldridge's letters giving fellow members the great benefit of his knowlede of *Calophasia lunula* Hufn. Surely one of the objects of our Society is to give as much practical help as we can to our own members? Every word that Mr. Aldridge has written in reply to criticism seems to me only to add to his stature. I have often thought how helpful it would be if members notified us in the *Bulletin*, in good time, of the advent of say an immigration of *Pontia daplidice* Linn. On the last occasion in 1945 I, personally, had no knowledge of the influx of the Bath White, or I should have made an effort to take it.

The same applies to *Colias hyale* Linn., as again I never heard until too late. Perhaps Mr. Aldridge or another kind member will inform us this season if there is an immigration, as it is a long way to go without definite knowledge.

There is altogether too much of keeping things to ourselves and I welcome Mr. Aldridge's generous gesture.

[Since the minimum time necessary from manuscript to *Bulletin* is six weeks, this kind of topical news service is not possible.—Ed.]

Answers to Quiz

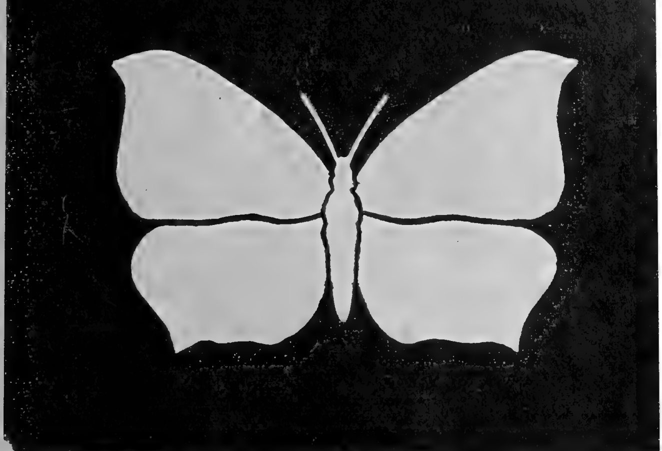
1. The Ruddy Highflyer (*H. rube-rata*).
2. The Brick (*O. circellaris*).
3. Poplar Grey (*A. megacephala*) (the word megacephala means 'big head' in Greek).
4. The Suspected (*O. suspecta*).
5. Satin Carpet (*C. ribeata*).
6. The Miller (*A. leporina*).
7. Beautiful Pug (*E. linariata*).
8. The Satellite (*E. transversa*).
9. Portland (*A. praecox*).
10. Archer's Dart (*A. vestigialis*).
11. Cousin German (*N. sobrina*).
12. Large Nutmeg (*H. sordida*).
13. Nonconformist (*X. lambda*).
14. Dark Spectacle (*H. triplasia*).
15. Neglected (*N. castanea*).
16. Hebrew Character (*O. gothica*).
17. Blackcollar (*N. flammatra*).
18. Brimstone (*R. luteolata*).
19. Maiden's Blush (*C. punctaria*).
20. Seraphim (*L. halterata*).

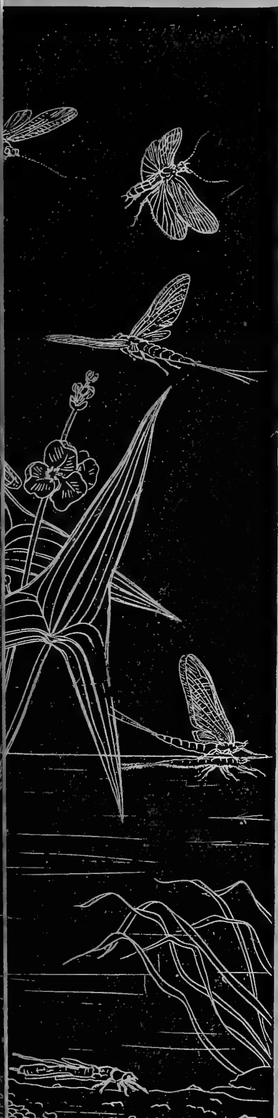
Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. 1955.

VOL. 14

No. 173

1955





THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

World List abbreviation : *Bull. amat. Ent. Soc.*

EDITED by B. R. STALLWOOD

AES NOTICE

WHERE TO WRITE

Membership applications, offers of help to: D. Ollevant, *3 Salcombe Drive, Morden, Surrey.*

Advertisers to: L. W. Siggs, *10 Repton Road, Orpington, Kent.*

Changes of address and non-arrival of Bulletins *to*: B. L. J. Byerley, *48 Elmgrove Road, Harrow, Middlesex.*

Offers to lead Field Meetings, exhibit, etc., to: S. M. Hanson, *167 Gunnersbury Park, London, W.5.*

Manuscripts, drawings and books for review to: B. R. Stallwood, *19 Southfield Gardens, Strawberry Hill, Twickenham, Middx.*

Subscriptions (12/- per annum, 6/- for Juniors) to: R. W. Watson, *15 Halstead Road, Bitterne, Southampton.*

Youth matters to: F. C. Brown, *6 Osmond Gardens, Wallington, Surrey.*

AES

Members can help the Society in several ways:—

(a) By dealing with advertisers and mentioning the *Bulletin*.

(b) By bringing in new members. (Subscription, 12/- per annum. Juniors, 6/- per annum.)

(c) By buying AES publications and suggesting Public Libraries should buy them.

(d) By friendly co-operation with other members.

(e) By taking just that extra bit of trouble required to record happenings of note for the *Bulletin*.

A E S BULLETIN
No. 173
MAY 1955

SOME BEETLE (AND OTHER) PARASITES

In the December number of this journal, Mr. E. Lewis (1954, 114) published an interesting note on the parasitization of beetles by Gordiid worms. Having had the good fortune some years ago to meet with an instance of this—although it was not until several years later that I realised the fact!—I may perhaps put the circumstances on record.

As I was walking along a country road in Gloucestershire, not far from the famous Roman Villa at Chedworth, in the Cotswolds, on a glorious spring morning in 1944, I came upon a specimen of the very common black Carabid, *Feronia madida* (Fab.), lying in the road, in a very unhappy condition—in fact, it was obviously moribund. Its legs were only feebly twitching, and upon examination I found that what looked like coiled lengths of intestine were protruding from between the abdominal segments. These showed no sign of movement, and I concluded that the beetle had been somehow injured, perhaps by a bird or a passing vehicle, resulting in the extrusion of the viscera.

I dropped the unfortunate insect in the herbage by the roadside, and moved on. What was my surprise, however, to see, only a few yards farther along the road, another *F. madida* likewise in difficulties. This one was certainly not so "far gone" as the first, for it was still able to some extent to walk, but it was making very poor progress. Its legs were obviously partly paralysed, and when I looked closely I found that this specimen, too, had protruding "viscera", which were dragging on the ground and impeding its progress.

This second specimen made me "think again". What could be the reason for this strange phenomenon? The idea of accidental injury seemed unconvincing, but I was quite at a loss for a better explanation. At last, however, I bethought me of parasites—but then completely "barked up the wrong tree" as to the kind of parasites involved!

By a curious coincidence, I had, only four months previously, in another part of the Cotswolds, found another specimen of this much-afflicted beetle (*F. madida*), dead under a stone, with some curious horn-like objects projecting from its abdomen. They looked "fungoid", so I sent the beetle to my then colleague, Miss E. M. Wakefield, of the Royal Botanic Gardens, Kew. She passed it on to Mr. T. Petch, an expert in entomogenous fungi, and he identified the fungus as *Hirsutella eleutheratorum* (Nees) Petch, a conidial (asexual) form believed possibly to represent a stage in the life-history of the much better known *Cordyceps entomorrhiza* Fr. (see Airy Shaw, 1946, 140).

With this in the back of my mind, therefore, I sent the second Chedworth specimen to Miss Wakefield, in the hope that it might be something in her department. But, alas! she could make nothing of it. It did not seem to be "fungoid", so she threw the specimen away, and the matter was dropped, as one of the great unsolved mysteries of natural history.

Several years afterwards, I was visiting my mother in Cirencester. A thunderstorm occurred, and afterwards we went out into the garden for a stroll. As we passed the potato patch, our attention was arrested by the strange behaviour of what seemed to be a piece of white cotton on one of the plants. The air was now perfectly still, but the cotton was *waving about*! It did not take us long to discover that this animated cotton was, in fact, a long, thread-like worm. And then we saw others. We must have seen about a dozen altogether, within an area of less than 100 square yards in the vegetable garden.

This was something quite outside my ken—but at least it could not be classed as "fungoid", so this time a specimen was despatched to the Department of Zoology of the British Museum (Natural History). Within a few days a reply came from Dr. H. A. Baylis. The worm was a very large Nematode, *Mermis nigrescens* Dujardin, which in its early stages parasitizes earwigs and grasshoppers, and then emerges and burrows deep in the soil. It is well known to come to the surface after summer thunderstorms in order to lay its eggs on the

leaves of plants, where they are eventually eaten by, and so infect. their hosts. Dr. Baylis kindly enclosed reprints of two interesting papers about *Mermis* (see References, below); and furthermore—and here at last we get back to our original subject—he included a third paper, dealing with Gordiid worms!

As I read this, "bells began to ring" as to those two unfortunate *Feronia madida* at Chedworth! Dr. Baylis had very little information as to the hosts of Gordiids, but those known to him or recorded were: the ground beetles, *Calathus fuscipes* (Goeze), *Carabus violaceus* L., and *Feronia madida* (Fab.) (two records!), "and . . . . other Carabids"; the water beetle, *Dytiscus marginalis* L., "and possibly other species of *Dytiscus*"; the churchyard beetle, *Blaps lethifera* Marsh.; the bush cricket, *Decticus verrucivorus* (L.); and—just possibly—the common earwig, *Forficula auricularia* L.

Feronia madida recorded twice!—and on both occasions *two* species of Gordiid emerged from it! How I wished I had kept my specimens. I shall be wiser next time—I hope! But that they were Gordiids I have no doubt whatever. (See Townsend, 1948, 156.) If only they had moved, I might have had a clue! But I suspect that they had probably come to an untimely end, owing to their hosts having run out on to a dry, sunny road at the time of their emergence, and expired there, instead of remaining in the cool, damp herbage, where the worms could have made good their escape. As it was, they had probably emerged half-way, and then dried up and died.

There is evidently a wide field for observation and records of these interesting parasites. Only four species are known in Britain, all probably fairly widely distributed. Mr. Crotch's record of *Parachordodes violaceus* from *Phosphuga atrata* at Oban (Lewis, 1954) apparently represents an unrecorded host, and Dr. Baylis's map (1943, 194) is devoid of any records of Gordiids from the west coast of Scotland.

So: preserve all your parasites carefully—worms, of course, require spirit, unless submitted to an expert immediately, alive, in damp moss. You are almost certain to get something of interest sooner or later.

References.

BAYLIS, H. A., 1943. Notes on the Distribution of Hairworms (Nematomorpha: Gordiidae) in the British Isles. *Proc. zool Soc.* ser. B, **113**: 193-7.

——, 1944. Observations on the Nematode *Mermis nigrescens* and related species. *Parasitology*, **36**: 122-132.

——, 1947. The larval stages of the Nematode *Mermis nigrescens*. *Parasitology*, **38**: 10-16.

LEWIS, E., 1954. A beetle parasite. *Bull. amat. Ent. Soc.*, **13**: 114-5.

SHAW, H. K. AIRY, 1946. Miscellaneous notes and records (*Hirsutella eleutheratorum* (Nees) Petch). *Proc. Cotteswold Nats. Fld Cl*, 1944, **28** (3): 140.

TOWNSEND, C. C., 1948. A list of the Carabidae of Gloucestershire (*Feronia madida* (Fab.)). *Proc Cotteswold Nats. Fld Cl* 1947 **29** (3): 156.

H. K. AIRY SHAW (545).

VOLUCELLA ZONARIA PODA, AN ESTABLISHED INSECT

Mr. Ranger's report on *Volucella zonaria* Poda in Surrey and Middlesex (*Bull. amat. Ent. Soc.*, **14**: 24) serves to call attention to what I find to be a common failing in students of entomology in their early studies of an Order new to them. This is a failure to consult existing literature on any species which they come upon, and which may appear new, or even rare to them. A great deal of knowledge has been stored up relating to many species of insects, and this knowledge is wasted unless students make use of it. A great number of references to *V. zonaria* exists in our Journals which would serve to answer the queries expressed in Mr. Ranger's note. Thus the *Entomologist's Monthly Magazine* for 1945, **81**: 217, and 1946, **82**: 55 contains a full report of my finding this insect at the mouth of a wasp's nest in Bournemouth, and the subsequent obtaining and breeding out larvae found in the same nest at a later date; a figure of the larva is given in the last reference. Regarding the imago, this was first taken in England, at Edenbridge, Kent, more than 70 years ago by my old friend and colleague, the late Dr. F. Haines, and I have seen the actual specimen in his collection (now housed in the Dorchester Museum). Verrall (1901, *British Flies*, **8**: 669) reported it from the New Forest, and there is another report in the *Entomologist* as far back as 1870 (*Ent.* **5**: 22). Since 1945 when I first saw it in fair numbers in Bournemouth, I have noticed

it yearly, and it has been taken in plenty by Mr. Gurth Waller, who counted a score on ivy at Hythe, Kent, in 1946. *Zonaria* must now be considered as an integral part of our dipterous fauna, and a not uncommon British insect.

F. C. FRASER (890).

VOLUCELLA ZONARIA PODA AND *VESPA CRABRO* L. AT KEW

I was interested in Mr. James Ranger's note (*antea*, p. 24) on *V. zonaria* coming to light at Kew. I myself have never known it to do this, but the species has been seen constantly in the Kew district since the war: see *Kew Bulletin*, **1948**, 118-9; **1949**, 236; **1952**, 287. Ivy bloom from late August into October has a strong attraction for it.

The hornet is certainly known in Kew Gardens: see the records in *Kew Bull.*, **1949** and **1952**, *ll.cc.* The former was actually the first record for the Gardens, so it may be a relatively recent arrival. Mr. Ranger is, alas, only too right when he says he "cannot imagine such a frightening thing as a hornet's nest being allowed to remain for long in Kew Gardens". A nest of these splendid insects was found in 1950 in the big Maidenhair tree (*Ginkyo biloba* L.) near the Ferneries, and destroyed. The scene of desolation and destruction presented by the scores of corpses and nest-fragments around the base of the tree was not pleasant. An assurance was given that efforts would be made to see that this was not repeated.

In spite of its greater size and "frightening" appearance, the hornet is a much less aggressive insect than are the wasps, and, in so far as it includes wasps in its prey, must be regarded as a definitely beneficial species.

H. K. AIRY SHAW (545).

EXPERIMENTS: A CAUTION AND A SUGGESTION

Far be it from me to pour cold water on any attempt by my fellow-members to perform scientific experiments, but I think it is a pity that they should be frustrated at the outset by an incomplete grasp of the problem which they hope to investigate. There are so many factors—usually quite a breath-taking number—bearing upon *any* biological problem, that it is far too easy for even the scientifically trained professional to overlook some of them.

A case in point is the recent suggestion (*Bull. amat. Ent. Soc.*, **13**: 92) by Mr. H. K. Airy Shaw that an investigation might be made into the height at which certain insects fly. This is an admirable idea, but a practical suggestion has yet to be made as to the method.

A few of the major snags stand out a mile. The first is that populations of *all* insects vary literally (though minutely) *yard by yard* across any area, causing a large variation in a relatively short distance. This, as Mr. Airy Shaw obviously appreciates, necessitates any comparison being made with respect to results obtained *at one spot on the map.* Secondly, Dr. C. B. Williams' work with the light-traps at Rothamsted has shewn how enormously the many meteorological conditions affect insect activity, and thus the number of insects attracted to a light. It is seen to be quite impossible in the present state of our knowledge (or lack of it!) to compare catches on consecutive nights except with respect to weather conditions, and even then, only by complicated statistical juggling. On no account are we able to compensate in any way for such weather conditions, say by multiplying by a factor.

Further, a sudden change in the rate of emergence of insects from pupae may often influence numbers very greatly and completely upset calculations. This variation from night to night is often quite enormous, and the only apparent solution would be the running of a virtual series of lights *all at once* for a number of nights. However, this would cause them to interfere with each other so much as to make their efficiency doubtful (if bright enough to bring in large enough numbers for a comparison to be made).

Lastly, it has been shown that insects are *not* attracted to light, but merely attempt, while in flight, to balance the stimuli received by each eye. Thus, they tend to fly either directly towards, or directly away from, a light source, but, as their eyes are at their front ends, the former is more likely. In any case, we are much more likely to see and record those insects flying towards our lights and the sanctuary of our killing bottles than those which retreat (? stray) into the realms of outer darkness! This fact allows insects to deviate vertically without unbalance, which would spoil height-of-flight measurements; and also explains why the governing factor for the efficiency of a light source is its degree of con-

trast with the background, with actual brightness and "colour" (i.e., frequency content) mere runners-up. Thus, not only would the size of the light source be of paramount importance, but so would its brightness, its colour, and the sort of contrast provided by the contents of the rooms behind Mr. Shaw's windows.

Now, maybe, members can begin to see why experiments, however simple, should be "vetted" by a trained biologist before being embarked upon. Although this would not make the experiments infallible (nothing is that), at least there will be a fair chance of their producing some worth-while and valid information, but if it is not done, members will only waste their efforts producing useless or misleading results, becoming themselves misled into believing fallacies, and embittered towards "science" and "professionals" in general. It is this that makes me so keen on method (*Bull. amat. Ent. Soc.*, **13**: 69).

I suggest that all our scientifically trained members who feel able and willing to help other, less fortunate (?), members with matters of method should submit their names and the fields in which they are most likely to be able to help and advise, for inclusion in the Membership List.

Members could then write to the appropriate one as to the Advisory Panel. By way of an example, I should like to offer any help I can give.

PETER G. TAYLOR (719).

COLLECTING BY LIGHT IN 1881

[The following has been extracted from a boys' magazine, *The Union Jack*, for 1881, edited by G. A. Henty.]

"First of all, to get the moth to come and pay us a visit, we want a light in the room, and one near the window. An insect is as fond of a light, poor thing, as an alderman is said to be of turtle soup . . .

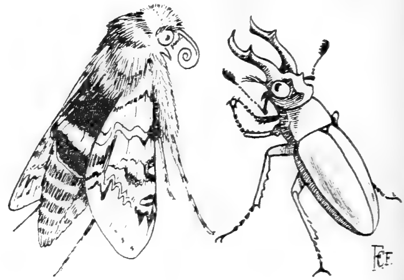
Put a candle, then, on the table, and one on the window-sill: gas is better, but what lad amongst us could afford to use it? The electric light would be best, but that, too, is quite out of the question. . . .

Say it is about eight o'clock when we commence to get ready, we shall then have a long hour for collecting. Later on, however, is the best time, from about 10.30 p.m. onwards; but this is very late, much later than some would care to sit up.

For a time when you have placed your candles all is quiet . . . . Then comes a loud bump! It is a big moth, who has run head-first at the window-pane. . . .

Then you rise gently, and taking your net, pass it slyly out of the window, and, heigh presto! in a moment the moth is taken. In another moment it is in the killing bottle. In a third it is dead".

T. H. PENNINGTON (2315).



Mrs. Fraxini—"Yes, I'm the last of my race."
Mr. Cervus—"What? Hydrogen bomb?"
Mrs. Fraxini—"No. Light-traps!"

ADVISER ON STATISTICS

Mr. A. Heselden, B.Sc. (2084), has offered to act as adviser to members on statistical matters. He will be able to give advice on statistical problems, both in connection with the design of experiments, and the treatment of results. He is also prepared to undertake various statistical calculations which may be necessary where these are mathematically difficult. He has access to calculating machines and statistical literature.

The A.E.S. Council is grateful to Mr. Heselden for his offer and hopes that members will make use of it.

D. OLLEVANT (Gen. Sec.).

PRATICAL HINTS — May

The busy season is now upon us, and all the usual means of collecting will bring results of some sort. "Light" seems the favourite nowadays, and for those who operate a trap I should like to offer the suggestion that unwanted specimens should be released AFTER DARK. If the trap is turned out in daylight the bird population soon get to know that the trap indicates an easy meal. The result being that 90% of the moths will be devoured before reaching cover. For normal collecting, I never operate the trap two nights running, and always keep unwanted material until dusk. Furthermore,

killing agents are never used; pieces of egg separators laid in the bottom provide suitable hiding places for the prisoners.

Beat lichen-covered branches and search tree trunks for larvae of *Cleora lichenaria* Hufn. (Brussels Lace).

Searching the trunks of Ash and beating branches and saplings after dark, may reveal larvae of *Atethmia centrago* Haw. (Centre-Barred Sallow). The larvae hide by day on the ground, but ascend the tree after dark.

Scopula ornata Scop. (Lace Border) should be looked for on chalk hills towards the end of the month into June. It is a local species but fairly common in its haunts, where it may easily be disturbed from the grass and other herbage during the day. Whilst searching for this species you may come across *Pseudopanthera macularia* Linn. (Speckled Yellow). This pretty little geometer is more widely distributed than the previous species, not confined to chalk, and takes to the wing readily during the day.

Light will attract *Drymonia ruficornis* Hufn. (Lunar Marbled Brown). Females will lay freely, but the larvae require careful treatment, airy cages and not to be overcrowded if they are to be reared successfully. Also *Colocasia coryli* Linn. (Nut-Tree Tussock) common in Beech woods; *Cerura furcula* Cl. (Sallow Kitten); *Apatele rumicis* Linn. (Knot grass) and *Polyploca ridens* Fab. (Frosted Green). This moth looks like *rumicis* on first glance, but is not so common; look carefuly at all *rumicis* which alight on your sheet, the light hindwings and whitish marking at the base of the forewings will indicate *ridens*.

Electrophaës corylata Thunb. (Broken-Barred Carpet) may be found in fair numbers on tree trunks in the vicinity of Blackthorn or plum orchards. *Aethalura punctulata* Schiff. (Grey Birch Beauty) another trunk squatter, is found in, or near, Birch woods. Females lay freely if placed in a 3″ collecting box with a small spray of birch leaves. By making a small hole at the shoulder of the box, the stem may be pushed through, bottom replaced, and the whole stood in a glass jar containing water. These boxes make useful cages for laying females, starting young larvae, etc.

Minoa murinata Scop. (Drab Looper) is very local, though common where it occurs. Search woodlands where the foodplant, Wood Spurge, grows freely. Open places where the trees have been felled, are likely spots. Walk slowly among the herbage keeping a sharp look-out for the small light brown moths to take to the wing. Captured specimens are frequently in poor condition, so try to get a couple of females; these will deposit their eggs on the underside of wood spurge leaves in the boxes mentioned above. If possible, keep the foodplant alive with the eggs intact, so that the young larvae do not require transferring when they hatch. A fine sprinkling of dry peat on the floor of the cage will serve their needs for pupation. In captivity, it is usual for moths to emerge in August.

Butterflies on the wing this month include *Pieris napi* Linn. (Green Veined White), *Leptidea sinapis* Linn. (Wood White) somewhat local in woodland rides, borders of woods, etc., *Erynnis tages* Linn. (Dingy Skipper), *Euphydryas aurinia* Rott. (Marsh Fritillary), more frequently found on dry hillsides and open woodlands than marshes or open country, and *Celastrina argiolus* Linn. (Holly Blue) which is to be found around holly bushes.

R. V. Aldridge (262).

•

PREDATOR ON *SATURNIA PAVONIA* LINN.

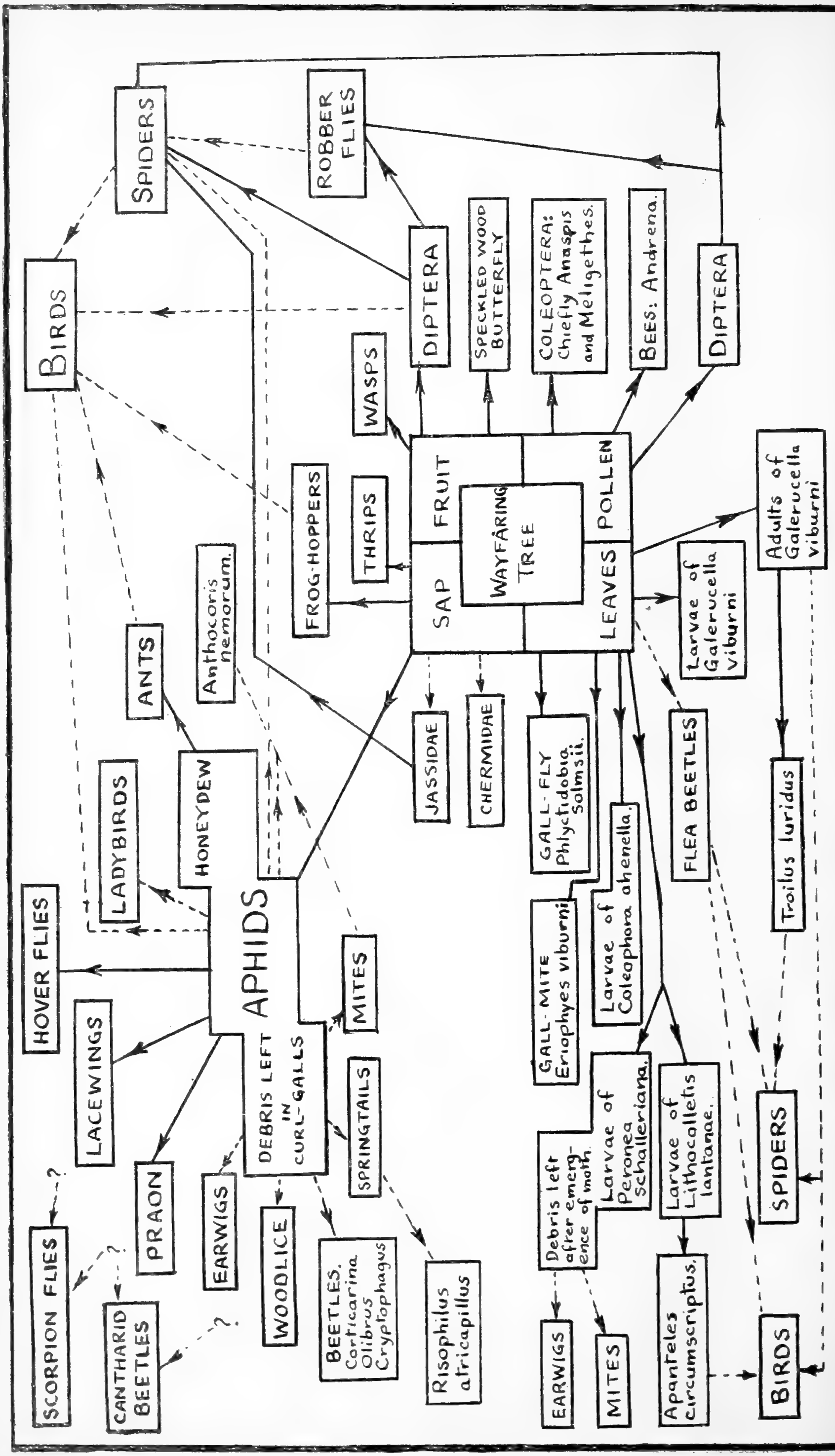
The unknown predator on *Saturnia pavonia* Linn. (see *Bull. amat. Ent. Soc.* **14**: 18), about which Mr. E. S. Lewis (373) enquires, is the common Nightjar or Goat-sucker, which has the peculiar habit of consuming its food at one spot. This is usually marked by a large stone or flint, on which the bird bashes its prey to break it up, and which probably accounts for the food being found in small heaps. In the Bournemouth district, the usual food of the bird consists of the common dung-beetle *Typhaeus* (*Ceratophyus*) *typhoeus* (Linn.), the remains of numbers of which may be seen in small heaps among the heather.

F. C. Fraser (890).

•

SILVER WATER BEETLES AT LIGHT

Professor Frank Balfour Browne would be glad of information from members using light-traps, as to whether *Hydrophilus piceus* Linn. (Large Silver Beetle) or *Hydrochara caraboides* Linn. (Lesser Silver Beetle) are ever taken, either in the trap or on the sheet. If so, the weather conditions at the time would also be of interest.



FOOD CHAINS ON THE WAYFARING TREE —— FEEDING OBSERVED. ------- FEEDING PRESUMED.

A STUDY OF THE INSECTS LIVING ON THE WAYFARING TREE (5)

(*Continued from page 31*)

FOOD-CHAINS

The food-chains that could be worked out with the Wayfaring Tree as the starting point are very many and very complex. The accompanying chart is an attempt to show some of these, but if every insect living on the Wayfaring Tree were shown and lines drawn in every possible way between predators and their prey the chart would present a maze of lines which would be most difficult to follow.

The food-chains indicated with a firm line are those that I have actually observed during the course of this study. The broken lines represent possible and in many cases highly probable food-chains. These I have put in either because circumstantial evidence was very strong in suggesting them, or because I have been able to find records of similar food-chains in entomological literature.

Although the Wayfaring Tree supports quite a large community of insects and other animals, it does not usually suffer any extensive damage from any of them. None of the feeders on the shrub become a pest because there is such a fine balance between the different species. Perhaps this is part of the reason why the Wayfaring Tree is so successful in its habitat.

APPENDIX

A complete list with brief notes of all the insects found on the Wayfaring Tree between April 1952 and September 1953. The names used are those given in Kloet and Hincks' *Check-List of British Insects*. Many have not been identified down to species. These are listed under the lowest category to which they can be assigned.

COLLEMBOLA Several species of Springtails were found but none were identified. In curl-galls, leaf-pockets and on flowers. April-October.

ORTHOPTERA (Tettigoniidae)

Leptophyes punctatissima Bosc. A long-horned grasshopper. On foliage. June 28th 1952.

Meconema thalassinum Degeer. A long-horned grasshopper. On foliage. August 21st 1952

DERMAPTERA (Forficulidae)

Forficula auricularia L. Common Earwig. Found in curl-galls sheltering during daytime. Also on flowers. Present April-October. Frequent.

THYSANOPTERA Thrips. Species not determined. Common on the flowers in May. A few odd ones also on foliage.

HEMIPTERA-HETEROPTERA

Palomena prasina L. (Pentatomidae). Shield-bug. Adult on foliage Sept. 28th 1952. A mass of 28 eggs on lower side of a leaf were found on May 23rd 1953 and hatched on June 10th. The eggs were pale green flattened ovoids, apparently smooth but seen to be slightly rough when viewed under a lens. There was a ring of very short spines near the top.

Second or third instar nymphs were found on July 11th 1953 and fourth instar nymphs on August 25th.

Acanthosoma haemorrhoidale L. (Pentatomidae). Shield-bug. Adult found Sept. 28th 1952 and June 13th 1953, and a fifth instar nymph on August 25th 1953.

Troilus luridus Fabricius (Pentatomidae). Shield-bug. Empty eggs found on August 25th 1952. (See Fig. 8c.) Also fourth instar nymph feeding on *Galerucella viburni* Paykull.

Anthocoris nemorum L. (Anthocoridae). Very frequent from April to Sept. Found in curled leaves, in leaf-pockets and on flowers. Adults and nymphs of all instars were found. A predator in all its stages.

Calocoris norvegicus L. (Miridae). July 19th 1952, on foliage.

Apolygus pratensis L. (Miridae). Sept. 28th 1952, on foliage.

Deraeocoris ruber L. (Miridae). July 19th 1952, on foliage.

Phylus coryli L. (Miridae). June 12th 1952, on foliage. A stray from hazel.

(*To be continued*)

LETTER TO THE EDITOR

"NEOVANDALISM" — A REPLY

R. I. LORIMER (600) writes:—

Bull. amat. Ent. Soc. **14**: 17, gives a prominent place to a paper entitled "The Neovandalism". I should like to reply, both on my own account and on behalf of many trap-operating friends whose collecting ethics are attacked by the author.

Running all through the article is the basic misconception that all moths taken in a trap are, of necessity, slaughtered. This is not so. It is easy, either with or without the use of an anaesthetic, to ensure that all insects taken will be fit to fly away the next evening. Lt.-Col. Fraser, I feel, must have a low opinion of his fellow lepidopterists and feel that the ethical standards of those who operate must, perforce, be lower than the standards of those who eschew them. In actual fact, whether the collecting medium is a pot of treacle, a pressure lamp and sheet or a light trap, one takes what is needed for breeding, or for the cabinet, and releases the remainder. Reducing the matter to its lowest terms—confronted with several thousand corpses, how would one go about getting them set? Even more pertinent to-day—how could one afford to provide enough cabinet space to house them?

Lt.-Col. Fraser's plea for putting back what is taken out should have the full support of all lepidopterists, and expresses a principle which I am sure most of us try to practise, especially with the less common species.

It is because this *Bulletin* is so widely read by younger entomologists, that I have written at such length to defend the best tool yet invented for the study of night-flying insect population, against an attack which I sincerely believe to be ill-informed.

REVIEW

Insects and Spiders. By C. P. Friedlander and D. A. Priest. Pp. 124. Price 6/6. Pitman.

This is primarily a text book for schools, for use in the classroom and the field as a means of identification and classification of specimens.

Its main features consist of keys to families of insects, families and genera of spiders, and line drawings shewing the main structural features of the species to which the keys refer. About a hundred families of insects and seventy genera of spiders are included. Some, such as the Lepidoptera and Odonata, are but briefly mentioned, and the reader is referred for further information to the bibliography at the end of the book, which contains, however, only references to South's *Butterflies* and *Moths of the British Isles* and Cynthia Longfield's *Dragonflies of the British Isles,* in respect of these orders.

However, as a comparative newcomer to entomology (although well past school age), the reviewer is of the opinion that the scheme of the book is good, although it, and the bibliography, might with advantage have been extended. With care the keys and diagrams are not difficult to follow, and when favourable weather provides the opportunity to put it to test in the field, it should prove both interesting and instructive.

At the modest price of 6/6 it can certainly be recommended as a reasonable "buy" for the beginner.

B. W. Y. G.

Handbooks for the Identification of British Insects. Vol. X, Part 4 (a). Diptera Cyclorrhapha, Calpytrata (1), Section (a). Tachinidae and Calliphoridae. By F. I. van Emden. 133 pp., 42 figs., 1 map. Published by the Royal Entomological Society of London, 41 Queen's Gate, S.W.7. 1954. Price £1.

In the opening chapter of this book the author explains a few characters that have not been referred to in the three previous parts. It is a pity these could not have been included in the Introduction (Part 1). There is some useful information on the preparation of specimens to show the genitalia which in many cases is indispensable for identification.

A list of hosts from Crustacea to Man, giving the page reference to the particular parasite which attacks it, precedes the keys.

The expert should do well with the keys, but the newcomer to Diptera may find them rather laborious, although when the end is reached one feels more confident of the result than when using "Day, 1946". The information on distribution and time of appearance is a very useful part of the work. The layout of the eight hundred odd line drawings are a great improvement on the three previously published parts, and are first class.

B. L. J. B.

Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. 1955.

PUBLICATIONS
of the
Amateur Entomologists' Society

"THE AMATEUR ENTOMOLOGIST"

Volumes in print are

Volume 5

Contains articles on "Some British Moths Reviewed" by W. H. T. Tams; "Habits of some British Moths" by Dr. E. A. Cockayne; "Setting Lepidoptera" and other papers.

Price 4s 6d

Volume 8

Contains illustrated articles on "Collecting Dragonflies," "Collecting Micros.", Sweepnets, "Collecting Mosquitoes," an eight-page list of standard books on Entomology, etc.

Price 5s (Members 3s 6d)

Volume 9

Practical Methods and Hints for Lepidopterists. Contains illustrated instructions for making many types of breeding and other cages; articles on breeding and collecting larvae; and illustrated instructions for making beating trays.

Price 5s (Members 3s 6d)

Volume 10

Contains illustrated articles on "Collecting Lacewings," "Drawing Insects," "Collecting Caddises," "Photography of Caterpillars," etc. 12 photographic plates.

Price 6s (Members 4s 6d)

Volume 11

A Coleopterist's Handbook. Describes the tools and apparatus and methods of collecting British beetles: their habitats, commensals and pre-adult stages; how to record, photograph, make a personal collection and conduct a local survey. 20 plates.

Price 15s

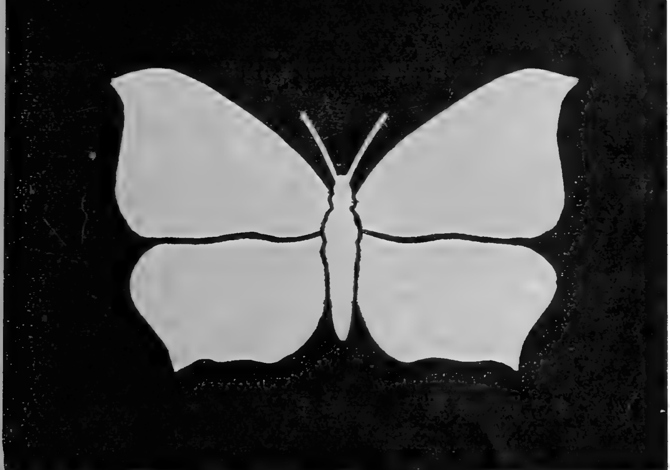
AES Bulletin

Volume 7, 1946-8.	232 pp., cover and index.	21s
Volume 8, 1949.	96 pp., cover and index.	10s 6d
Volume 9, 1950.	108 pp., cover and index.	10s 6d
Volume 10, 1951.	124 pp., cover and index.	10s 6d
Volume 11, 1952.	116 pp., cover and index.	12s 6d
Volume 12, 1953.	96 pp., cover and index.	12s 6d
Volume 13, 1954.	116 pp., cover and index.	12s 6d

VOL. 14

No. 174

1955



THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

World List abbreviation : *Bull. amat. Ent. Soc.*

EDITED by B. R. STALLWOOD

AES
BULLETIN
No. 174
JUNE 1955

COUNCIL REPORT FOR 1954

(as read at the Annual General Meeting in March 1955)

The membership of the Society has maintained itself at about the same level during the year, whilst the proportion of Junior to Full Members now joining, has shown an increase. The *Bulletin* appeared regularly and promptly, and included the Membership List and Geographical Key in the April issue. The *Coleopterist's Handbook* was published, and was well received by the Reviewers and is selling well.

Both the Annual General Meeting in March, and the Annual Exhibition in September, were well attended. Full reports of these two meetings have appeared in the *Bulletin*. Seven Council Meetings were held during the year, with an average attendance of thirteen.

The position of the Study Groups was as follows:—There was little activity in the following Groups and members interested are asked to write to the conveners:—Diapause; Cockroach; Time of Emergence from Pupae; and Distribution of Elephant Hawk. In the last named a report of the findings is being prepared for publication in the *Bulletin*.

The Microscopy Group has continued to thrive, and now has twenty-three members. During the year the Group Bulletin has circulated periodically to all members, and has not only been a means of contact, but a help in solving problems of members widely separated from each other.

Distribution of Certain Lycaenidae:—The Convener's report shows that whereas *Lysandra coridon* Poda was seen in normal numbers, *Lysandra bellargus* Rott., *Celastrina argiolus* Linn., *Plebejus argus* Linn., *Aricia agestis* Schiff., *Cupido minimus* Fuessl. and the summer brood of *Polyommatus icarus* Rott. were much scarcer than usual.

The Silkmoth Study Group gave evidence of its activities by again providing an exhibit which filled the platform at the Annual Exhibition. Two or three members have been concentrating upon enriching the field of study, and a dozen uncommon species were last year seen here alive for the first time. Some, but not all, were successfully paired and reared. At least two members have been making coloured drawings of various stages of the life cycles, and Mr. Smith (1641) has been consistently adding to his remarkable colour-photo records of living larvae, cocoons and moths. Another member embarked upon cine-photography in colour. All these records are being placed at Mr. Crotch's disposal for the new edition of *The Silkmoth Rearer's Handbook*. The three problems which are currently being pursued between members of the Group are (1) enrichment of food for winter rearing, (2) possible sexual dimorphism among Saturniid larvae, (3) possible sexual attraction of mature larvae.

London Meetings Group: The Winter meetings were held in the first three, and the last two, months of the year, the attendance averaging nineteen. The Field Meetings were not a success, but some members took advantage of the invitation by Mr. Parmenter (895) to attend Field Meetings of the Entomological Section of the London Natural History Society. Two visits by the Group to the London Zoo, at the invitation of Mr. L. C. Bushby (1075), proved very popular.

A new Group, the Micro-Lepidopterists' Group, is in the process of being formed. The Insect Galls Group is now defunct.

D. Ollevant (1514)
(Honorary Secretary).

PRACTICAL HINTS—June

Collecting with 'sugar' and light will keep the average lepidopterist busy again this month. A word of warning to beginners: please don't take more specimens than you can conveniently manage. How easy it is to capture fifty moths at mercury vapour light; but how useless if you only have a dozen setting boards! Always leave your captures on the boards long enough for the wing muscles to harden thoroughly. My

minimum time for an average noctuid is a month.

Toward the end of June search Stinging Nettles for larvae of *Vanessa atalanta* Linn. (Red Admiral). They conceal themselves within a folded leaf. Leaves folded down the centre (midrib) usually contain—or have contained—*atalanta*, whilst those rolled from tip to stem contain *Hypena proboscidalis* Linn. (The Snout). *Euphydryas aurinia* Rott. (Marsh Fritillary) should be in full flight during the first week of the month. A very local insect and worth searching for, wherever the foodplant —Devil's-bit scabious — occurs in quantity. *Plebeius argus* Linn. (Silver-studded Blue) will be on the wing from mid-June to August. Dry sandy heaths are its favoured haunts. The moors around Sidmouth often abound with this species.

Beat Hawthorn for larvae of *Lasiocampa quercus* Linn. (Oak Eggar) and search the underside of Maple leaves for larvae of *Ptilophora plumigera* Schiff. (Plumed Prominent). *Drepana binaria* Hufn. (Oak Hooktip) comes freely to light or may be disturbed from oak trees by day. Females will lay freely, and the larvae are easy to rear. Overcrowding will surely produce small moths with this species, as, too, it does with *D. falcataria* Linn. which is common in birch woods during the early part of the month. When resting on a leaf the moth is not easily noticed; in cool weather it will drop to earth rather than fly away.

Coenonympha tullia Muell. (Large Heath) will be flying in its Northern haunts; whilst in the South, larvae of *Apatura iris* Linn. (Purple Emperor) will be fully fed. This species is very local and uncommon; should you visit a known locality in search of larvae, *please search* and do *not* beat the sallows. This latter method is probably in any case the least productive.

Among the commoner moths you should get this month are:—*Habrosyne derasa* Linn. (Buff Arches), *Thyatira batis* Linn. (Peach Blossom) —both species being fond of 'sugar'. *Phalera bucephala* Linn. (Buff Tip), *Mimas tiliae* Linn. (Lime Hawk), *Diataraxia oleracea* Linn. (Bright-line Brown-Eye) and *Euplexia lucipara* Linn. (Small Angleshades).

When taking *Meristis trigrammica* Hufn. (Treble Lines) at the 'sugar' patch, keep a look-out for var. *semifuscans* Haw. in which the outer half of the forewings are suffused with brownish—to use a term of R. South. In other words, there is a dark, broad band down the outer half of the wing.

Boarmia punctinalis Scop. (Pale Oak Beauty) is to be found at rest on the boles of trees or may be attracted to light.

R. V. Aldridge (262).

THE INNOCENT AMONG THE HYMENOPTERA

One sunny January morning I was engaged in the pleasant task of searching moss on tree stumps for pupae of lepidopterous insects, which are my great delight at this time of year, when I suddenly surprised four black and orange wasp-like creatures. I have often found this type of insect in this situation, on previous occasions, but this time I decided to find out what they really were. I carefully placed them in a large tube and carried them off for a closer perusal. I had just found a few pupae of the Clouded Magpie (*Abraxas sylvata* Scop.) and I was hot on the scent of more.

I kept my four wasps alive on sugar and water for several days before I had a chance to look again, and they seemed to thrive on this diet. I took Step's *Ants, Bees, Wasps and Allied Insects* from the shelf and on the dust cover saw a portrait of my prisoners, or so it seemed—the only difference lay in certain white spots on the thorax and last abdominal segments of my specimens. I looked through all the Pompilid Spider Hunting Wasps but apart from the superficial resemblance there was no sign that I had found the right family. I took down *The Hymenopterist's Handbook* and began at the beginning of the dichotomous "Key to Suborders and Superfamilies of the Hymenoptera". I soon realised that I needed a dead specimen to follow out instructions, so I put one of my old friends (so they seemed by now) in the killing bottle, carefully avoiding contact with her "sting," which she had showed me several times and then proceeded to make a drawing of her antennae, legs and wing pattern with the help of a low power microscope. I noticed that the forewings had a small cell which I later found was called an areolet and it was this clue which led me to the "Key to the Ichneumonoidea". I was able to discover that my captures were of the family Ichneumonidae, but beyond a suspicion that they are ♀ *Ichneumon suspiciosus* Wesmael, I can go no

further. I shall have to resort to the expert for verification. It seems to me that some expert could give a few more keys for species in the families of ichneumons which are frequently met by lepidopterists in the course of collecting or breeding their own specimens, or even a few drawings and notes of the commoner species of parasite. We are frequently urged to take more interest in these creatures but very little is done to whet our appetites.

J. H. JOHNSON (1040).

LETTER TO THE EDITOR

AN APPEAL FOR TEAM WORK

DAVID H. HEPPELL (1690) writes:—

With reference to the letter by Mr. G. H. W. Cruttwell (118) (*Bull. amat. Ent. Soc.*, **14**: 36) may I add a word or two?

The idea of our Society is, or should be, to keep fellow entomologists in contact with each other. It is surprising to me that, out of approximately eight hundred members, a meagre dozen or so see fit, each month, to send in their few notes and results.

In 1950 I remember reading (*antea*, **9**: 93) of the suggested forming of study groups; here it was suggested that the "main function of groups would be to collect from the whole body of the A.E.S., the information which members discover and don't know what to do with"; I also read, somewhere, that secretaries of groups would send reports of progress in various investigations to the *Bulletin* for publication. How few of these reports we see. There must be many problems puzzling our members that the groups could elucidate. If we are going to be united as a society let us, for Heaven's sake, work as a team. More so in particular in the study groups. Let us all hear of each other's problems, investigations and results.

[For Study Group reports see *antea*, **14**: 45.—ED.]

A STUDY OF THE INSECTS LIVING ON THE WAYFARING TREE (6)

(*Continued from page 43*)

HEMIPTERA-HOMOPTERA

Cercopis vulnerata Germar (Cercopidae). Frequent in May and June both in 1952 and 1953. This is the well-known red and black frog-hopper. They were found on the foliage and stems, sometimes several together.

Aphrophora spumaria L. Adults frequent June-October.

Philaenus leucophthalmus L. Adults from June to September. Frequent.

Centrotus cornutus L. (Membracidae). Several found on foliage on May 20th 1953. Some were in cop.

Jassidae. Several of these occurred at various times during the summer but were not identified further.

Cixius nervosus L. (Cixiidae). Found on Sept. 28th 1952 and again on June 13th 1953.

Trichochermes walkeri Foerster (Chermidae). A single specimen on Aug. 21st 1952.

Chermidae. A number of other jumping plant-lice were found, especially towards the end of the summer, but have not been identified.

Aphis lantanae Koch. (Aphididae).

Ceruraphis eriophori Walker (Aphididae). The causer of the curl-galls of the leaves.

NEUROPTERA

Chrysopa carnea Stephens (Chrysopidae). Green lacewing.

MECOPTERA

Panorpa communis L. (Panorpidae). Scorpion-fly.

LEPIDOPTERA

Very many accidental occurrences of larvae of Lepidoptera were noted during the course of this study. They had usually strayed from neighbouring plants or dropped from overhanging trees and shrubs. There were also many different species of adult butterflies and moths found resting on the leaves or branches. Among those noted were the Green Hairstreak, the Common Blue, and the Angle Shades moth.

Pararge aegeria L. (Satyridae). The Speckled Wood Butterfly was seen feeding at the ripe fruits on Sept. 13th 1952.

Peronea schalleriana L. (Tortricidae).
Coleophora ahenella von Heinemann (Coleophoridae).
Lithocolletis lantanella Schrank (Gracillariidae).

COLEOPTERA

Risophilus atricapillus L. (Carabidae). Frequent in curled leaves. Probably preys on springtails.
Oxytelus tetracarinatus Block (Staphylinidae). One only., April.
Cantharis nigricans Mueller (Cantharidae). Several. On flowers and foliage in May.
Cantharis rustica Fallén (Cantharidae). On foliage in June.
Rhagonycha lutea Mueller (Cantharidae). On foliage in June.
Rhagonychya fulva Scopoli (Cantharidae). On foliage in July.
Rhagonycha lignosa Mueller (Cantharidae). One only. On foliage in May.
Metacantharis clypeata Illiger (Cantharidae). One only. On flowers in May.
Malthodes minimus L. (Cantharidae). One only. On foliage in June.
Adelocera murina L. (Elateridae). Frequent on foliage in May.
Athous haemorrhoidalis Fabricius (Elateridae). A common click beetle. Frequent on foliage in May and June.
Agriotes acuminatus Stephens (Elateridae). Another click beetle. On the flowers in May.
Denticollis linearis L. (Elateridae). A few on foliage in May.
Dascillus carvinus L. (Dascillidae). Several on foliage in June.
Byturus tomentosus Degeer (Byturidae). Very common on the flowers in May.
Meligethes atratus Olivier (Nitidulidae). Two only. On flowers in May.
Meligethes flavimanus Stephens (Nitidulidae). Given as *M. lumbaris* Sturm in the Check-List. A few only on flowers in May.
Meligethes aeneus Fabricius (Nitidulidae). Very common on the flowers in May and probably also in the last weeks of April.
Meligethes viridescens Fabricius (Nitidulidae). Common on flowers in May.
Meligethes nigrescens Stephens (Nitidulidae). Common on the flowers in May. Given as *M. picipes* Sturm in the Check-List.
Meligethes erythropus Gyllenhal (Nitidulidae). Common on flowers in May.
Epuraea melina Sturm (Nitidulidae). Frequent on flowers in May.
Epuraea deleta Sturm (Nitidulidae). A few on flowers in May.
Cryptophagus acutangulus Gyllenhal (Cryptophagidae). A few on flowers in May.
Olibrus corticalis Panzer (Phalacridae). One only in curled leaf. April.
Corticarina gibbosa Herbst (Lathridiidae). Frequent on flowers, in curled leaves and in leaf pockets. Found from April to September.
Adalia decempunctata L. (Coccinellidae). The 10-spot ladybird and the commonest ladybird on the Wayfaring Tree. April to October.
Adalia bipunctata L. (Coccinellidae). The two-spot ladybird. April to October.
Coccinella septempunctata L. (Coccinellidae). The seven-spot ladybird. May to November.
Calvia 14-guttata L. (Coccinellidae). A less well-known ladybird. September to October.
Psyllobora 22-punctata L. (Coccinellidae). The 22-spot ladybird. Also known as *Thea 22-punctata* L. One only on flowers in May.
Exochomus quadripustulatus L. (Coccinellidae). One only in June.
Anaspis rufilabris Gyllenhal (Mordellidae). Common on flowers. May.
Anaspis maculata Fourcroy (Mordellidae). Common on flowers in May.
Isomira murina L. (Alleculidae). Several on foliage and on withering flowers in May and June.
Gonodera luperus Herbst (Alleculidae). A few on foliage in June.
Melolontha melolontha L. (Scarabaeidae). One only on flowers in May. The cockchafer.
Phyllopertha horticola L. (Scarabaeidae). On foliage. June. The Garden chafer.
Clytus arietus L. (Cerambycidae). On foliage in June. The wasp-beetle.
Cryptocephalus pusillus Fabricius (Chrysomelidae). One only. July.
Cryptocephalus bipunctatus L. var. *sanguinolentus* (Chrysomelidae). A few on foliage in June.
Galerucella viburni Paykull (Chrysomelidae). The leaf-beetle of the Wayfaring Tree.

Lochmaea crataegi Forster (Chrysomelidae). A few on foliage. April and May. A stray from hawthorn.

Aphthona euphorbiae Schrank (Chrysomelidae). A flea-beetle. Very frequent on the foliage in April and a few on flowers in May. This beetle used to be considered uncommon but has been reported to be increasing in numbers in various parts of the country. Formerly thought to be attached to spurges but the recent reports are of its occurrence on several different plants.

Longitarsus luridus Scopoli (Chrysomelidae). Another flea-beetle. Several on foliage. April to October.

Chaetocnema concinna Marsham (Chrysomelidae). Another flea-beetle. Frequent on foliage in September 1952 and again in April 1953.

Apion dichroum Bedel (Curculionidae). One only on flowers. May.

Phyllobius virideaeris Laicharting (Curculionidae). Several in May and June.

Phyllobius pyri L. (Curculionidae). One only. On flowers in May.

Polydrosus cervinus L. (Curculionidae). One on flowers in May and one on foliage in June.

Anthonomus rubi Herbst (Curculionidae). One on flowers in May and one on foliage in June.

Curculio nucum L. (Curculionidae). The hazel-nut weevil. One only on foliage in August. Accidental.

Ceuthorrhynchus sp. (Curculionidae). One only. On foliage in June. Species undetermined.

Balanobius pyrrhoceras Marsham (Curculionidae). One only on flowers in May.

Rhynchaenus fagi L. (Curculionidae). Several on foliage. Strayed from beech. This weevil hops like a flea-beetle.

HYMENOPTERA

Tenthredo temula Scopoli (Tenthredinidae). A saw-fly. One only on foliage. June. A female.

Tenthredopsis litterata Fourcroy (Tenthredinidae). A saw-fly. One only on foliage. June. A male.

Dolerus sp. (Tenthredinidae). A saw-fly. Species undetermined. April. On foliage.

PARASITICA. Many of the parasitic forms of several families were seen at various times throughout the spring, summer and autumn on flowers, foliage and fruit. The few identified are given here.

Apanteles circumscriptus Nees (Braconidae). The parasite of the leaf-mining larva of *Lithocolletis lantanella* Schrank.

Praon (Aphidiidae). Species undetermined. Parasitic on aphids.

Horogenes (Ichneumonidae). Species undetermined. This genus is given as *Angitia* in the Check-List but I am using here the name given to me by Mr. G. J. Kerrich. The single specimen of this insect was obtained from a cocoon found on the under-side of a leaf of the Wayfaring Tree on June 3rd. It was under a sheet of white silk and attached to the leaf. The cocoon itself was made of a white silky material but showed yellowish through the covering. Beside it was the skin of the insect which had been parasitized but I could not even assign this to an order as it was quite dried up. The parasite emerged on July 22nd.

Microgaster (Braconidae). This is the parasitic Hymenopteron found on the flowers on May 17th 1952. This genus is parasitic on lepidopterous caterpillars but this specimen was a male.

Phaenocarpa ruficeps Nees (Braconidae). Two specimens on foliage in July. This is parasitic on Diptera.

Triclistus globulipes Desvignes (Ichneumonidae). This is a parasite of Tortricidae, but this specimen was feeding at the ripe fruit in August.

Myrmica ruginodis Nylander (Formicidae). This ant was frequent all through the season but especially in April and May. Usually associated with aphids.

Lasius niger L. (Formicidae). The same remarks apply to this ant.

Formica fusca L. (Formicidae). A few only on foliage.

Vespula vulgaris L. (Vespidae). Feeding on the ripe fruits in August and September. The only wasp doing so. Very common.

Trypoxylon clavicerum Lepeletier (Sphecidae). Bred from pupae found in hollow stem.

Andrena (Apidae). Several of these visited the flowers in May. The only two identified were *A. haemorrhoa* Fabricius and *A. flavipes* Panzer.

Diptera Very many of these were found on flowers, foliage and fruit. Only a small fraction was collected and of them only the few listed below were identified.

Bibio (Bibionidae). On May 14th 1953 females of three different species of *Bibio* were found on the flowers. On the same day males of one of the species were found on the foliage. This bears out a note to this effect given in Colyer and Hammond (1951) p. 75.

Empis tessellata Fabricius (Empididae). On flowers in May.

Empis livida L. (Empididae). On foliage. June.

Lucilia sp. (Calliphoridae). Feeding on ripe fruit in August and September.

Sarcophaga sp. (Calliphoridae). Feeding on ripe fruit in August and September.

Syrphidae. At least two species preying as larvae on aphids.

Phlyctidobia solmsi Kieffer (Cecidomyiidae).

Animals other than Insects found on the Wayfaring Tree

Spiders Very frequent and of many different species. The few identified were:

Xysticus viaticus L. (Thomisidae)
Misumena calycina L. (Thomisidae)
Aranea cucurbitina Clerck (Argyopidae)
Theridion pallens Blackwall (Theridiidae)
Lycosa sp. (Lycosidae)

Mites Several different species. The only one named is the causer of the galls on the leaves. It is *Eriophyes viburni* Nalepa.

Woodlice Two species found at various times in curled leaves and on the branches of the shrub were:

Porcellio scaber Latreille (Oniscidae)
Armadillidium vulgare Latreille (Armadillidiidae)

Snails The following snails were found on leaves or branches:

Trichia hispida L. (Helicidae)
Helicella heripensis Mabille (Helicidae)
Helicella caperata Montagu (Helicidae)
Helix aspersa Müller (Helicidae)

Acknowledgments

I am indebted to the following gentlemen for their very kind assistance in the identification of certain groups:

Mr. R. G. Davies, Imperial College .... Hemiptera-Homoptera
Mr. J. D. Bradley, Brit. Mus. (Nat. Hist.) .... Micro-Lepidoptera
Dr. A. M. Easton, Great Bookham .... *Meligethes* (Coleoptera)
Mr. G. J. Kerrich, Commonwealth Institute of Entomology .... Parasitic Hymenoptera
Mr. T. R. E. Southwood, Rothamsted Experimental Station ...... Hemiptera-Heteroptera
Mr. H. L. G. Stroyan, Dept. of Zoology, Cambridge .... Aphididae

All other identifications were made by myself, using the books listed in the references.

REFERENCES.

9. Elton, C. 1927, Animal Ecology.
10. Imms, A. D. 1934, Text-book of Entomology.
11. Imms, A. D. 1947 Insect Natural History.
12. Colyer, C. N. and Hammond. 1951, Flies of the British Isles.
13. Saunders, E. 1896, Hymenoptera-Aculeata of the British Isles.
14. Savory, T. H. 1935, Spiders and Allied Orders of the British Isles.
15. Locket, G. H. and Millidge. 1951, British Spiders, Vol 1. 1953, Vol. 2.
16. Webb, W. M. and Sillem, C. 1906, British Woodlice.
17. Joy, N. H. 1932, Practical Handbook of British Beetles.
18. Edwards, J. 1896, Hemiptera-Homoptera of the British Isles.
19. Royal Entomological Society. 1949-1953, Handbooks for the Identification of British Insects. (Parts published to date).
20. Kloet, G. S. and Hincks, W. D. 1945, A Check-List of British Insects.
21. Bristowe, W. S. 1939-41, The Comity of Spiders.

DREPANA BINARIA HUFN. (LEP. DREPANIDAE) in Yorkshire

Last summer, on May 30th, I was "beating" near a small oak wood, between Leeds and Harrogate, when a small, brown moth flew out. I caught it and identified it as *Drepana binaria* (Oak Hook tip).

As far as I am aware, this moth has not been taken north of Lincoln, and, indeed, Ford, in the distribution map in his new book, *Moths*, shows its range to be even more restricted to the South of England.

I am going to investigate the locality again this year, and hope to be able to prove that the range of *D. binaria* is extending northwards.

MICHAEL S. KAY (2399).

•

TELENOMUS (HYM. PROCTOTRUPOIDEA) —A CORRECTION

Since the publication of my note on *Telenomus* (*Bull. amat. Ent. Soc.* **14**: 9) I have been in correspondence with Dr. G. V. Bull (160), who has sent me specimens bred from the eggs of the Poplar Hawk, *Laothoë populi* L. These turn out to be *Telenomus sp.* Thus my idea that the genus might be restricted to Bombycoid moths is untrue.

The relationship of the hosts mentioned before by me is simply a coincidence. This is further confirmed by other records given by Clausen (*Entomophagous Insects*, **1940**).

M. F. CLARIDGE (1420).

•

REVIEW

Moths. By E. B. Ford. The New Naturalist, vol. 30, illustrated by 148 photographs (77 in colour); 19 maps and diagrams; pp. 266 including index. Collins, London, 1955. Price, 35/-.

The Editors and the author are at pains to point out that this book is not a text book of British moths: nor can it be satisfactorily read without a previous acquaintance with Dr. Ford's earlier volume on *Butterflies* (No. 1 in the series). The two books were conceived as a whole and the chapters on genetics in the *Butterflies* volume provide the basis for the more advanced discussion with which the *Moths* volume opens. Dr. Ford's purpose is to use the Lepidoptera to illustrate some of the principles of Natural History (p. 130): and what floods of light he manages to throw into obscure places!

The book is not easy reading until one has become completely confident about the meanings of the technical terms of genetic science; but even those who find heterozygotes and allelomorphs confusing concepts will nevertheless find a mine of interesting matters throughout the book. It is written with lucidity, vigour and an infectious enthusiasm; it scintillates with ideas that ought to be followed up. Dr. Ford has not much regard for the man who collects moths like postage stamps, but he is eager for the help of those who love insects as living, developing creatures.

"Any instance of polymorphism is a challenge to the naturalist just as it is to the student of evolution, for it advertises a situation that is bound to provide critical problems in the adjustment of a species to its environment . . . problems of the very type which the moth collector . . . is well fitted to detect and study" (p. 63). Your reviewer suggests that here is a fruitful field for new, interesting and *valuable* work by AES members. Dr. Ford indicates that information on the relative abundance of dimorphic forms of the following moths would be very welcome:—

Dark-barred Twin-spot Carpet (*Xanthorhoe ferrugata* Cl.)
Jersey Tiger (*Euplagia quadripunctata* Poda)
Mottled Beauty (*Cleora repandata* Linn.)
Orange Moth (*Angerona prunaria* Linn.)
Riband Wave (*Sterrha aversata* Linn.)
Wood Tiger (*Parasemia plantaginis* Linn.)

Attention is also specially drawn to the Annulet (*Gnophos obscurata* Schiff.) in which polymorphism is astonishingly illustrative of adjustment to background. It is "whitish from the chalk, red-brown from the sandstone of South Devon and blackish from dark soil in Surrey" (p. 97).

The chapter on protective devices is full of interest. For example, how many AES members who know the larva of the Lobster Moth (*Stauropus fagi* Linn.) also know that "if disturbed the creature raises the front

part of its body, bending back like a snake about to strike, at the same time extending the forelegs, the second pair of which begin to vibrate rapidly. It then somewhat resembles an ant or perhaps a spider, certainly not the caterpillar of a moth, and probably the deception often saves it. In addition, however, it has the power of ejecting formic acid of considerable strength from a gland opening below the front segment of the thorax. Such a gland is widespread among the larvae of moths, but in this, and some other species, it is much enlarged. The discharge is certainly powerful enough, if well directed, to disable a small bird; furthermore, some of the acid is usually present on the surface of the body, probably making the insect unattractive not only to normal predators but also to the Ichneumons which might otherwise parasitise it" (p. 110). Having regard to this gamut of protective reactions, one wonders why the moth is not far more common than it is.

A short chapter on Injurious Moths is followed by one on Geographical Distribution, with special references to new or little-known species. A fascinating discussion of types of habitat comprises Chapter 10 and reference is made to a new colony of the Clifden Nonpareil (*Catocala fraxini* Linn.) which provides large numbers of larvae and imagines. (Incidentally, this species also recently became abundant in Denmark.) In the ensuing chapter on Relict Faunas, a separate section is given to Irish Lepidoptera. Later in the book there is a separate section on the Shetlands. The penultimate chapter is devoted to the phenomenon of melanism and comprises a very full discussion of the facts and their implications. How many members are conscious of the existence of melanic larvae—or, if aware of them, realize that the gene determining the form in the caterpillar is quite distinct from that governing the black form of the imago? For, in general, melanic larvae turn into normal moths while melanic moths, as a rule, give rise to normal caterpillars. How many know that dark chitin is less pervious to water-vapour than light chitin, so tending to prevent desiccation? Pupae living in very dry situations, e.g. when buried in sand, are particularly dark (p. 100). Your reviewer had noticed this, but quite unthinkingly, in Saturniid pupae from East Africa.

For members more concerned with the outdoor pursuit of insects than with breeding or laboratory techniques, there is a great deal that can be done simply by marking and recapture of moths. In his chapter on Dispersal (p. 74 et seq.) Dr. Ford draws attention to the astonishing effects of small open spaces separating habitats. We are all aware of the enormous distances covered by migrating species: yet a few hundred yards of open heath or sea channel may, it appears, often segregate colonies of moths powerful on the wing, such as the Scarlet Tiger (*Panaxia dominula* Linn.). Even an ordinary hawthorn hedge, apparently trivial, may become an effective boundary for the Grass Rivulet moth (*Perizoma albulata* Schiff.).

Members who are more interested in butterflies than moths may care to note pp. 215-222 in the closing chapter on evolution. They are devoted to the latest studies of the Meadow Brown (*Maniola jurtina* Linn.) by Dr. Ford and his colleagues.

Special reference must be made to the plates—all from photographs by Mr. S. Beaufoy. Those in black and white are almost uniformly excellent, but I cannot join the chorus of adulation with which other reviewers have greeted the colour plates. It is probably the colour printing, not Mr. Beaufoy's transparencies which are at fault: but several plates are too yellow or of a poor green for daylight examination. Nearly all improve under artificial light. Some haziness is obviously due to defective registration of successive colour imprints: notably, in my copy, Plate 18 picturing the male and female Emperor Moth (*Saturnia pavonia* Linn.). The print of the male on the little advertising leaflet is sharp and natural in tone: on the plate the same picture is hazy and too light.

Finally, there are an Appendix on Classification, an excellent glossary and a useful index, with only a negligible sprinkle of omissions and failures of cross-references. For true students of entomology this book is likely to be a necessity for the rest of this century.

W.J.B.C.

Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. 1955.

VOL. 14

No. 175

1955

THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

World List abbreviation : *Bull. amat. Ent. Soc.*

EDITED by B. R. STALLWOOD

AES NOTICE

WHERE TO WRITE

Membership applications, offers of help to: D. OLLEVANT, *3 Salcombe Drive, Morden, Surrey.*

Advertisers to: L. W. SIGGS, *10 Repton Road, Orpington, Kent.*

Changes of address and non-arrival of Bulletins *to*: B. L. J. BYERLEY, *48 Elmgrove Road, Harrow, Middlesex.*

Offers to lead Field Meetings, exhibit, etc., to: S. M. HANSON, *167 Gunnersbury Park, London, W.5.*

Manuscripts, drawings and books for review to: B. R. STALLWOOD, *19 Southfield Gardens, Strawberry Hill, Twickenham, Middx.*

Subscriptions (12/- per annum, 6/- for Juniors) to: R. W. WATSON, *63 Commercial Road, Totton, Southampton.*

Youth matters to: F. C. BROWN, *6 Osmond Gardens, Wallington, Surrey.*

BACK NUMBERS

OF THE

AES BULLETIN

1s. 3d. a copy

are available from:—

B. L. J. BYERLEY,
48 Elmgrove Road,
HARROW, Middlesex

Complete volumes with covers and index

Volume 7,	1946-8	232 pp.	**21s.**
Volume 8,	1949	96 pp.	**10s. 6d.**
Volume 9,	1950	108 pp.	**10s. 6d.**
Volume 10,	1951	124 pp.	**10s. 6d.**
Volume 11,	1952	116 pp.	**12s. 6d.**
Volume 12,	1953	96 pp.	**12s. 6d.**
Volume 13,	1954	116 pp.	**12s. 6d.**

From

A E S, 1 WEST HAM LANE,
LONDON, E.15

AES BULLETIN

No. 175

JULY 1955

ANNUAL GENERAL MEETING

The Annual General Meeting was held at the Linnaean Society's rooms at Burlington House on the afternoon of Saturday, 26th March 1955.

It was preceded by a conversazione, and by the President's address, an interesting talk by Mr. P. C. Le Masurier (978) on "Some Reminiscences of a Lepidopterist".

As a result of uncontested elections, the AES Council for 1955-56 is constituted as follows:—

President: R. Hilliard (99)
General Secretary: D. Ollevant (1514)
Treasurer: R. W. Watson (752)
General Editor: W. J. B. Crotch (1181)
Bulletin Editor: B. R. Stallwood (1547)
Publications Secretary: C. B. Pratt (784)
Advertising Secretary: L. W. Siggs (243)
Meetings Secretary: S. M. Hanson (320)
Youth Secretary: F. C. Brown (2414)
Registrar: K. H. Bobe (912).
Councillors: W. B. Broughton (1632), D. I. Chapman (1648), R. R. H. Hill (2253*), E. Lewis (952), K. C. Side (2140), L. S. Whicher (1345), B. L. J. Byerley (788).

The General Secretary presented the Council's Report for 1954 (*vide Bull. amat. Ent. Soc.* **14**: 45).

D. OLLEVANT (1514),
General Secretary.

•

PRACTICAL HINTS — July

Anyone planning to collect whilst away on holiday would do well to spend an evening compiling a list of species likely to be found in the particular area. Reference to *Text Book of British Butterflies and Moths*, Newman & Leeds, will provide most of the data required. Armed with this, you will have a useful guide, which should assist in adding a number of species to your collection. I shall be pleased to contact anyone who will be in North Devon during the first two weeks of July. My headquarters will be a cottage at Hartland Point where a Tilley lamp will be operated nightly. By day I shall be touring the N. Coast on motor-cycle VKX 743.

Thecla quercus Linn. (Purple Hairstreak) is common enough in its favourite oak woods, and on hot sunny days the butterflies will be flying high up among the branches of the lofty oaks. When I last took this insect, in 1945, the locality was visited one evening when a stiff breeze was blowing and within half an hour my boxes were full, since the butterflies were coming down to ground level: presumably to escape the wind.

Strymon pruni Linn. (Black Hairstreak) is not as rare as some believe. It may be seen in large numbers not 45 miles from London. It occurs in Bucks. in several localities, and may even remain unnoticed in your county—if you live in the South anyway. The butterfly occurs in large open oak woods with plenty of blackthorn as undergrowth. Where privet is in flower they may be seen in numbers feasting on the flowerheads.

Hypena rostralis Linn. (Buttoned Snout). The larva is to be found by day on the underside of hop leaves. *Harpyia hermelina* Goeze (Poplar Kitten). Examine trunks of poplar trees and surrounding fences, etc., by day for freshly emerged moths. Beat *Clematis vitalba* (Old Man's Beard) for specimens of *Horisme tersata* Schiff. (The Fern) and *Melanthia procellata* Schiff. (Pretty Chalk Carpet). Both species are attracted to light and when females are obtained they are very easy to rear. *Atolmis rubricollis* Linn. (Red-Necked Footman) flies in the afternoon sunshine, whilst on dull days it should be sought for on the herbage under trees. Occurs mainly in large woods but fluctuates in abundance. Also comes to light. *Comacla senex* Hb. (Round-Winged Muslin) is local in marshy places but frequently very common where it does occur. In the Fens of Norfolk it may sometimes be seen in dozens as it takes to the wing at dusk.

Lophopteryx cucullina Schiff. (Maple Prominent) will be emerging

toward the end of the month. Males come freely to light and usually arrive between 9.30 and 10.00 p.m. B.S.T. The species frequents open places where maple grows in plenty. It seems to prefer maple growing in hedges, on which to deposit its ova. To breed this moth, first get a small maple established in a large flower-pot, cover with muslin and deposit your female *cucullina* within. With luck, ova will be laid near a bud on the twigs. When they hatch keep an eye on the young larvae, and transfer any wanderers to a leaf bud. Tins, cages, etc., are not the ideal method of starting this species.

Common moths on the wing this month include:—*Plusia iota* Linn. (Plain Golden Y), *P. pulchrina* Haw. (Beautiful Golden Y), *Biston betularia* Linn. (Peppered Moth), *Notodonta dromedarius* Linn. (Iron Prominent), and *Chiasmia clathrata* Linn. (Latticed Heath).

R. V. Aldridge (262).

COMMENTS ON THE HABITS AND BEHAVIOUR OF THE HUMMING BIRD AND CONVOLVULUS HAWKMOTHS

Lt.-Col. N. Eliot, C.B.E., Cavalaire, Var, S. France, writes:—

As regards the many interesting points in "Moth Migrations to the British Isles" (*Bull. amat. Ent. Soc.*, **13**: 110), I am only able to comment on some dealing with *Macroglossum stellatarum* Linn. I have no evidence that the moth breeds in the low coastal areas of the French Riviera, and R. South's October brood would occur uncomfortably soon after the arrival of the migrants from the North. The idea that "at least" two broods occur, carries the suggestion that *more* than two can occur. This impression might derive from the spread of individual migration, and also perhaps of mating, and hence oviposition. In the case of *Colias croceus* Fourcr., as shown in a paper of mine (a) quoted by Captain Dannreuther, sudden drops of population numbers occur here, presumably caused by massive emigration, but both *Vanessa atalanta* Linn. and *M. stellatarum* arrive and depart more gradually, suggesting individual rather than mass migration.

My article (a) did not mention an incident which may be of interest regarding broods. On 17 June 1937 a *stellatarum* was seen feeding on wayside flowers at an elevation of 2900 ft. on a road running along the forested flank of a ridge in the Cevennes, somewhat East of Mende (Lozère). The presence of a presumably first brood moth in a place about 90 miles North in latitude of Cavalaire, and the not infrequent arrival in England of migrants in March, suggest that "June" moths are produced throughout France, except in unsuitable areas, such as the low-lying far South. The moths of this first brood, some of which would be fairly static, would have a short imaginal life, and would produce a second (migratory) brood. The whole process from the laying of the eggs from which the first brood develops, to the emergence of the second brood moths, would take, roughly, five months, say April to August inclusive.

The second brood moths migrate to the South to overwinter for around the seven months of September to March inclusive, when they again migrate, this time to the Northern areas where they oviposit. They thus have a long imaginal life. Although there is time enough for an extra brood between September and March, I have no evidence of one occurring. The behaviour of the moth with its intermittent hibernatory periods seems against it, and also the probability that one or other of the immature stages would undergo at least one of the more inclement winter months.

It seems unlikely that the habit of migrating Northward from here has been evolved on account of shortage of flowers. The simplest answer to that would be aestivation. A more likely cause would be a profusion of the larval food-plant elsewhere perhaps, with it withering here during the hottest and driest months, when Bee-farmers on the coast send their hives into the Basses Alpes from about 15 June to 15 September. There is little shortage of flowers until well on in May.

Habits in the Canary Islands.

As to Teneriffe, the *stellatarum* which were obtained 58 miles off Oran were probably crossing the Mediterranean where any reasonable course will end in a landfall. But the Canary Islands present such a small target, that I do *not* think the moth could maintain itself there continuously, year after year, if migration from overseas had to be relied upon. The following information

about Teneriffe is gleaned from a short article. "The climate is mild in winter, and moderate in summer, but it partakes of the arid characteristics of the neighbouring African coast. The dry season, centreing on summer, accompanies the North-East Trade winds. The Westerly winds, centreing on winter, accompany the winter rains. The average annual rainfall is 13 inches, and presumably the larger portion falls in the higher regions. The culminating point is the 12,100 ft. volcanic cone Pico de Teyde. Vegetation types differ with elevation."

Is Bedstraw, *Galium*, the food-plant in Teneriffe, or is there another? In any case, does it grow more freely in the rainy season in the higher regions, than in the coastal sub-tropical belt in the dry, hot season? Are observations more likely to be made there than in the higher regions?

It is stated that in Teneriffe *stellatarum* is seen for about the seven months from March to September inclusive, June being the month when it is most numerous. The hottest month of the dry season is August. The moth appears to be absent, or, at any rate, is not seen, for some five months, October to February inclusive. It seems possible, even probable, that the moths which appear in March are a second (migratory) brood which has come down from the higher regions, oversummers in the semi-tropical lower areas (perhaps assisted by intermittent aestivation) and then migrates back to the higher regions and produces the first (static) brood of the two produced there during the, roughly, five wet season months of October to February. The whole process would be as in France, except for the reversal of the seasons due to the then availability of larval food-plant.

Behaviour towards Mercury Vapour Traps.

As regards the avoidance of Mercury Vapour traps by *stellatarum*, I see no reason why it should have a vision over the same range of wave-lengths as most other moths. Observation in my garden showed that neither it, nor the Broad-Bordered Bee Hawk-moth (*Hemaris fuciformis* Linn.), nor any butterfly, with one exception, either avoided or preferred any flower on account of its colour. The exception was the Long-tailed Swallow-tail (*Iphiclides podalirius* Linn.), which was never seen to settle on scarlet or red, although it is common here and visits flowers of all other colours (b).

There may, however, be another explanation. Here a large number of moths, including four or five Hawk-moth species—and unfortunately hornets—have flown in through widely open windows to ordinary electric lamps. But I cannot remember ever having seen *stellatarum* do so. This I put down to *stellatarum* being so essentially day-active that, when living its ordinary life on land, it takes up sleeping quarters after dusk. It then either does not see the light or is too lethargic to respond. Conditions when migrating overseas at night are very different.

Mode of Migratory Flight.

The reason why migrating *stellatarum* do not loop over obstacles as butterflies do—although not invariably—may, perhaps, be found in the differing aerodynamics of "humming" and "flapping" flight. I have watched very many *stellatarum* in flight, although not migratory. It seems to me that the normal method by which *stellatarum* gains height is to fly straight forward, or on a wide curve, at a moderately easy gradient. The normal method would probably be the easiest and preferred. I have never seen a moth spiral vertically upwards. That does not mean that the moth is unable to "hum" more or less vertically upwards. I have seen it do so when trapped behind a glass window-pane, or feeding, with all its legs tucked closely under the body. But in the same situation the Broad-bordered Bee Hawk-moth stretches out its fore-legs to steady or help itself. It will settle on Buddleia, close its wings and walk over the florets. It has been noted that bees will pass over a belt of high trees on their way from the hive to a source of honey, but will avoid the trees by making an angular detour when returning fully laden. Bees have a good knowledge of the geography of their working areas, and the return by a detour presumably prevents the waste of energy; but if a Humming-bird Hawk-moth was naturally disinclined to exceed a certain angle of ascent, then, in order to fly over an obstacle when migrating, it would have to recognise the obstacle, and appreciate its characteristics, at a sufficient distance to enable it to adjust its flight suitably. So in this matter of looping over obstacles, not only the flight-mechanism of the insect must be taken into account, but also the acuity of its vision and the nature of the obstacle.

A migration of Large Cabbage Whites (*Pieris brassicae* Linn.) is of interest in this connection (c). The obstacle was my house, the long axis of which presented a fairly large area of smooth cream-coloured wall not quite at right-angles to the line of migration from slightly South of West. The Whites were flying in a leisurely manner at various altitudes. None attempted to pass into the comparative darkness of a room. Three-quarters of them appeared to recognise the house as an obstacle when between four and two feet distant. A few of these seemed to spiral upward, the majority turned their bodies parallel to the wall and flew courses varying from the horizontal adopted by one individual, to the 7 in 1 gradient upwards of another. The remaining quarter did not, at any rate at first, see the cream-coloured walls as an obstacle. They flew on until they came in contact with the wall, recoiled sharply about a yard or so, and looped upwards. In some cases this was repeated once or twice more before the wall was overleapt. As far as could be seen all resumed the direction of the migration as soon as the way was clear.

The following remarks on the behaviour of non-migrating butterflies may be of interest. *Charaxes jasius* Linn. often hurls itself against the light-coloured walls with a resounding smack; *Satyrus circe* Fabr. can be seen bumping gently on them repeatedly; while *Maniola ida* Esp. flutters against them as stupidly as against a plate-glass window (c).

REFERENCES.

(a) Eliot. Overwintering of Migrant Lepidoptera on the Côte d'Azur. 1953. *Entom.*. **83** : 118.

(b) ——— Some Notes on the Habits of Butterflies. 1948. *Entom.*, **81** : 64

(c) ——— Autumn Decrease of some Riviera Butterflies and Migrating *Pieris brassicae* 1949. *Entom.*, **82** : 245.

From Capt. T. Dannreuther (60): —

M. stellatarum in the Canary Islands.

I do not concur with Eliot's Teneriffe notes on *M. stellatarum* (*supra*), as the analogy of *P. brassicae* in India moving from plains to hills each season may not apply in the Canaries, as it has been proved by finding *Danaus plexippus* Linn. in all stages at the same time (in February) at elevations less than 1000 ft The latter species has become continuously brooded in those islands, though nowhere else yet. It will require further observation on the spot, to prove that *M. stellatarum* moves up the mountain to avoid drought conditions

Herse convolvuli flying by day.

As Lieut.-Col. F. C. Fraser (890) tells me that the race of *H. convolvuli*, which is common in South India, flies by day, my statement that this species is blind by day may not be correct. My opinion was based upon picking up a specimen on grass in 1944, here, and when lying in my hand in the sun, it refused to fly. I now think this might mean merely that it was comatose and lethargic, but not necessarily day-blind.

Mrs. V. M. Muspratt, F.R.E.S., of St. Jean-de-Luz, Basses Pyrénées, also confirms the fact that *H. convolvuli* flies by day in Southern France.

Michael S. Kay (2399) reports: —

I read Captain Dannreuther's excellent and informative article and was very interested to read that *M. stellatarum* is absent from the Riviera from April to mid-August. I caught one specimen, which I have preserved, on July 3rd 1954, about 20 miles inland, in the Alpes Maritimes, and on or about July 14th, at about 8.0 in the evening, one specimen made two rapid laps of the outside restaurant at the Carlton Hotel, Cannes, and then flew rapidly inland. These were the only *stellatarum* that I saw during the summer, but it indicates that in some years they can be found on the Riviera at that season.

1954 was, naturally, exceedingly warm on the Riviera, but, in common with England, it was not as hot as is usual. Probably the moths stay in one place only as long as the temperature is suitable to them, and then move Northwards.

SUCCESSFUL SUGAR-TRAPPING

Dr. Kettlewell's letter (*Bull. amat. Ent. Soc.* **13**: 114), one of the most humorous contributions to entomological literature that I have read for some time, must be put in proper perspective if the scientific implications of my article (*Ent. mon. Mag.*, **90**: 86) are not to be lost. The following records of 252 specimens of moths caught during two trapping periods, one covering the unfavourable winter months, the other a shorter but more favourable summer period, will serve to illustrate that some captures have been obtained. I regret not keeping details of my earlier samples, which included a number of Coleoptera and Diptera which were prevalent in the autumn. The sugar-trap was situated in a sheltered area surrounded by mixed coniferous trees, at Trawscoed, near Aberystwyth, Cardiganshire.

1952. October—27th, *Agrochola macilenta* Hb. 2; *Lithophane socia* Hufn. 1; November—5th, *Graptolitha ornitopus* Hufn. 1; *Xylena vetusta* Hb. 2; 8th, *Xylena exoleta* L. 1; 12th, *Conistra vaccinii* L. 2; *Conistra ligula* Esp. 1; 20th, *C. vaccinii* 2; *X. vetusta* 1; 22nd, *Eupsilia transversa* Hufn. 1. December—8th, *C. ligula* 1; *X. vetusta* 1; *E. transversa* 1; 11th-13th, *X. vetusta* 1; 20th-24th, *X. vetusta* 1; *L. socia* 1; *E. transversa* 1; 30th, *X. exoleta* 1.

1953. January—9th, *E. transversa* 1; 15th, *C. vaccinii* 1; 22nd, *E. transversa* 1; *C. vaccinii* 2; 29th, *C. vaccinii* 1; February—1st-19th, *E. transversa* 1. February 19th-March 5th, *E. transversa* 2; *C. vaccinii* 8.

Altogether a total of 39 specimens belonging to 8 species.

The low nightly average of moths taken is paralleled by the capture of only 90 moths in a variation of the Rothamsted light trap (cf. Miles 1953) situated in a walled-in kitchen garden of approximately one acre, at Trawscoed, employing a 100 watt "Pearl" bulb. This trap captured 44 *Poecilocampa populi* (L.) on one night, and but for this, the figure of 46 moths captured is close to the sugar trap result of 39. The paucity of moths in this part of Wales is illustrated by the failure of a "Robinson" mercury vapour light trap, employing a 115 watt bulb, operated nightly (week-ends excepted) since December 1954, to capture any specimens at all, up to the time of writing (15th March 1955).

The bait trap was moved to my garden at Aber Magwr (about one mile from Trawscoed) and operated for eight consecutive nights, June 24th-July 1st, 1953. Of a total of 213 moths caught, six specimens, one of which was a micro, were not named, the remaining 207 belonged to thirteen species as follows:—

1953. June—24th, *Agrotis exclamationis* Linn. 68; *Ochropleura plecta* Linn. 5; *Diataraxia oleracea* Linn. 5; *Euplexia lucipara* Linn. 1; *Amathes c-nigrum* Linn. 1; *Xylophasia lithoxylea* Schiff. 1; *Xylophasia monoglypha* Hufn. 1. 25th, *A. exclamationis* 36; *Axylia putris* Linn. 1; *O. plecta* 1; *X. monoglypha* 1; *Triphaena pronuba* Linn. 1; 3 specimens not named. 26th, *A. exclamationis* 25; *D. oleracea* 3; *X. lithoxylea* 1; *T. pronuba* 1; *A. putris* 1; *Procus strigilis* Clerck 1; *Diarsia rubi* View. 1; *O. plecta* 2; 1 specimen not named. 27th, *A. exclamationis* 8; *D. oleracea* 3; 1 micro not named. 29th, *A. exclamationis* 13; 1 specimen not named. 30th, *A. exclamationis* 4; *O. plecta* 1; *Leucania lithargyria* Esp. 1; *Mormo maura* Linn. 1; July 1st, *A. exclamationis* 2.

Although I have no light trap figures for June 1953, some indication of possible numbers of moths to be caught here in this month may be obtained from the fact that the highest catch on any night in June 1952 (week-ends excepted) was 133, on the 13th. The catch on the night of the 24th was 34, and 60 on the 25th, the second highest figure. On the night of the 24th June 1953, a catch of 87 moths was made by my bait trap.

Trials have proved that fermenting molasses is the most effective "all round" attractant, although it has the disadvantage, for experimental purposes, that, because of fermentation, samples of this bait are seldom identical. However, several more selective baits have been used in America with varying degrees of success (see van Leeuwen 1948, Eyer and O'Neal 1949, and Stahl 1954).

The bark used in my trap is absorbent, and is, therefore, a suitable "carrier" for these preparations. A shallow drip-tin slightly greater in diameter than the tree trunk used in my apparatus, will retain surplus attractant that might otherwise fall into the killing bottle. Perfect specimens are thus obtained, and even if they were not, their value would be unimpaired

for ecological purposes, as they can be easily cleaned and identified. Numerous collecting methods are in use by economic workers in which there is no attempt to secure the kind of cabinet specimens that the mere collector requires, e.g., Broadbent (1948)—grease banding compound; Cockbill (1945)—flotation; boiling specimens in water, after which treatment Kerosene is added; Pagden (1932) —Pyralid moths lured into Kerosene; Chapman and Kinghorn (1955)—fuel oil, or water with wetting agent.

One disadvantage of my trap is the attention it receives from birds in the day-time as they take feeding insects from the bait-covered tree-trunk before they have become sufficiently intoxicated to fall into the killing bottle. However, a few strands of black cotton attached to the roof at intervals discourages them. On one occasion a young robin actually met its death by falling into the killing jar.

An important feature of a bait trap is that it can be used anywhere without attention during the night—a point not to be overlooked when working in isolated areas, as Furneaux (1897), who used one successfully, fully appreciated. In conclusion, as Dr. Kettlewell says in his letter, I hope others will be stimulated to contribute to our knowledge of the little known practice of sugaring (bait) traps, but in the scientific rather than in the Gilbertian sense.

P. M. Miles.

REFERENCES

1. Miles, P. M. 1953, *West Wales Field Society* (15th Annual Report) 28-32.
2. van Leeuwen, R. R. 1948, *J. econ. Ent.*, **41** (No. 3) : 345-351.
3. Eyer, J. R. and O'Neal, E. J. 1949, *J. econ. Ent.*, **42** (No. 5) : 850-852.
4. Stahl, C. F. 1954, *J. econ. Ent.*, **47** (No. 5) : 879-882.
5. Broadbent, L., Doncaster, J. P., Hull, R., and Watson, M. A. 1948, *Proc. R. ent. Soc. Lond.* (A) **23** : 57-58.
6. Cockbill, C. F., Henderson, V. E., Ross, D. M., and Stapley, J. H. 1945, *Ann. appl. Biol.*, **32** : 148.
7. Jones, J. Morgan. 1950, *Ann. appl. Biol.* **37** : 316.
8. Pagden, H. T. 1932, *Malayan Agricultural Journal* **22** : 123.
9. Chapman, J. A., and Kinghorn, J. M. 1955, *Can. Ent.* **87** : 46-47.
10. Furneaux, W. 1897, *British Butterflies and Moths*, 96-97.

OBSERVATIONS

COLOUR CHANGE IN PRIVET HAWK LARVAE

D. J. Stradling (2146*) writes:—

During August 1953 I collected about forty full-grown larvae of *Sphinx ligustri* Linn. (Privet Hawk) in the suburbs of Bristol. All of these were found feeding on lilac and their 'horns' were black on top and pale yellow underneath as well as along the sides. These larvae all pupated successfully and emerged during July 1954. A pairing was obtained and the young larvae from the resulting ova were fed upon yellow privet until the first moult, being kept in glass containers.

They were subsequently transferred to a box which excluded the light, and fed thereafter on lilac. In the final instar the 'horns' on all the larvae were noticed to be completely black. It was also observed that the oblique markings on the sides of the larvae were also inclined to be black rather than the normal purple.

Was this colour change influenced by the darkness of the closed box?

SERVILLIA URSINA MG. IN THE LAKE DISTRICT

From R. Underwood (2338*).

While on a walk in the Lake District on April 15th, 1955, I noticed that several specimens of *Servillia ursina* Mg., a Tachinid, were to be seen flying about above a road and basking in the sun on rocks at the roadside. I found them present all along the road running through Rushland Valley (on the E. side of Lake Windermere). I sent a specimen to Dr. F. van Emden who has recently published some Tachinid Keys and he has kindly confirmed my identification. This species has apparently only been recorded once in the North of England (Cumberland) and even then there seems to have been some doubt about its validity.

I do not claim to be an experienced dipterist, and I know very little of the Tachinids, but the above observation does show that there is scope for new discoveries in this family, at least for the beginner, from the point of view of distribution.

Collector: "*Flammea*, from Sussex! Bagged 'em all in my MVL".

Entomologist: "Those contraptions must do a lot of harm?"

Collector: "Not at all, old chap. We release all the common stuff".

ON THE MISUSE OF LIGHT TRAPS

As a result of my plea for moderation in the use of M.V. lamps, I have received a number of communications and, in defending their use, it is noticeable that all employ the same argument, viz., that the bulk of the specimens coming to the trap are released. I am prepared to believe this but I am equally sure that if any rare or even uncommon species comes to the trap, its fate is sealed, and it takes the shortest journey to the store-box or cabinet. It is just these rarer species which we are concerned to preserve, and it is just these that the M.V. enthusiasts are decimating.

Now I see a new danger has arisen in the shape of the collector of records (*Bull. amat. Ent. Soc.* **14**: 34). It is obvious that to identify correctly the moths coming to the trap and to count them effectively, all must be killed. As a sample of mass destruction, the writer suggests that 200 moths on 200 nights may come to the trap, viz., 40,000; multiply this by 100 collectors making records, and we find their yearly depredations come to 4,000,000. Not bad for a scientific community.

F. C. Fraser (890).

Erratum: *Antea* **14**: 39b (line 41) for "virtual" please read "vertical".

ABUNDANCE OF *EULYPE HASTATA* LINN. (LEP. HYDRIOMENIDAE) IN SURREY

This pretty little day-flying moth, the Argent and Sable, appears to have increased in numbers during the last three years.

The writer, who has been making observations in the woods of N. Surrey since 1942, recorded only an occasional single example until May 1953 when some dozens were observed.

The same area was visited in 1954 and despite the lateness of the season, the moth appeared to be even more abundant, and observations this year seem to indicate that the species is maintaining its numbers.

The moth is found in oak-woods in association with *Pseudopanthera macularia* Linn. (Selidosemidae) the Speckled Yellow moth, and the butterfly *Argynnis euphrosyne* Linn. (Nymphalidae), the Pearl-bordered Fritillary.

Its 'season' also appears to coincide roughly with these two insects, usually the last two weeks in May, and like many Geometrid moths is not always easy to approach, seemingly sensitive to sounds of high frequency.

Freshly emerged specimens have been seen feeding at damp mud in company with *euphrosyne*, but bluebell and bugle blooms appear to be the usual sources of refreshment. On one occasion however the flowers of hawthorn proved attractive to *hastata*, a plant that the writer has usually found to be avoided by most lepidoptera.

B. R. Stallwood (1547).

CONTRIBUTIONS to the *BULLETIN*

The Editor would like to ask members sending copy for publication, to write or type *on one side of the paper only*, and to draw diagrams with *black indian ink on white paper*.

Co-operation on these small points, so easily overlooked, would be greatly appreciated.

LETTERS TO THE EDITOR

REFERENCES—AND THE AMATEUR

Peter G. Taylor (719) writes:—
I was very distressed to read the note by Lt.-Col. F. C. Fraser (890) about *Volucella zonaria* Poda (*Bull. amat. Ent. Soc.*, **14**: 39). When I read Mr. James A. Ranger's note on this species (*ibid.*, **14**: 24) I was very impressed by his evident enthusiasm, accuracy, sound approach, and style,

to say nothing of his very competent drawing. If only there were more amateurs like him in their willingness to put their observations into print!

I cannot understand Lt.-Col. Fraser's hasty and intolerant attitude towards beginners, and the younger of our entomologists. When a young amateur takes a rarity, he wants first—if he is worth his salt—to record it: it does not happen to him often. If he also requests a little information and tenders a few humble suggestions, so much the better: a reply could be most informative—to *all* readers, not just himself. Surely he should not be rebuked for his keenness.

How can an amateur, and especially a young one, be expected, with the limited resources at his disposal, to search the literature for odd crumbs of information about his find? As Lt.-Col. Fraser's own references imply, this would entail the enormous labour of a search through several hundred volumes of the major periodicals, and the perusal of some exorbitantly priced text-books. How can the amateur, with his limited means and time, be expected to do this? The only efficient methods of doing so involve a visit to London for at least one whole day, probably several, and access to a large entomological library. The former involves great expense, and the latter the discouragement of complicated procedure for obtaining permission, etc., or, at least, the joining of a major entomological society (more money) to gain access to its library.

No, sir, let us be realistic about the capacity of amateurs, and tolerant of their limitations. Let us be helpful and encourage them, and try to see their point of view.

From L. W. Siggs (243): —

I trust that none of your contributors will be discouraged by Lt.-Col. Fraser's opinion (*Bull. amat. Ent. Soc.* **14**: 38) that the failure to consult existing literature is "a common failing" in students of entomology in their early studies of an Order new to them. Many of them do not have access to back numbers of the Journals and some have not the time to check through them to establish a point. I think that the *Bulletin* serves a useful purpose in affording to amateurs the help which experts like Lt.-Col. Fraser so kindly give.

Incidentally, the cartoon (*ibid*: 40), presumably from the hand of Lt. Col. Fraser, amused me in a way which I imagine he did not intend. My search is not complete, but so far I can find no reference to the capture of a ♀ *Catocala fraxini* L. in a light trap. The caption should surely read: —

Mrs. Fraxini: Yes, I'm the last of my race.
Mr. Cervus: What, hydrogen bomb?
Mrs. Fraxini: No, *sugar*!

I see that Lt.-Col. Fraser's interests are O., N., Orth. Could it be that L. is a new Order to him and that he did not check his references? If so, of course, he proves his point.

REVIEW

The World of Small Animals. By T. H. Savory. Pp. 160, with black and white plates and line drawings. Price 15/-. University of London Press.

Many naturalists must have been attracted to the study of some of the less well-known groups of invertebrates, only to be deterred by the difficulty of finding literature suitable to help them over the initial stages, and by lack of easily obtainable works dealing with identification.

This book is an attempt to satisfy that need, and it will undoubtedly encourage the study of some of the less popular groups. There are chapters on earthworms, woodlice, silver-fish, earwigs, cockroaches, ants, dragonflies, mosquitoes, centipedes, harvestmen, false-scorpions and slugs. Keys for the identification of British species are included in some of them.

Amongst so much that is very good, it is unfortunate that there should be some shortcomings that may mislead the beginner who does not already know something about the subject. In the chapter on cockroaches, the inclusion of a metatarsus in the description of the leg is an unfortunate slip, and a little further on when the arolia are mentioned it is misleading not to point out that they are not possessed by *Blatta orientalis* Linn. which is the cockroach most likely to be encountered first. The keys also are over-simplified in some cases, and this may lead to wrong identifications. This is especially so in the key to woodlice, where too much reliance is placed on colour. However, the book contains so much good advice and useful and sound information that the keen all-round naturalist will want a copy on his bookshelf.

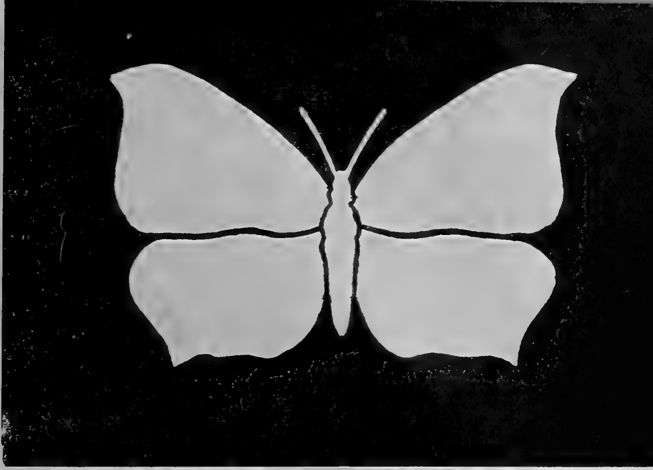
K. C. S.

Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. '955.

VOL. 14

No. 176

UST - - 1955



THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

World List abbreviation : *Bull. amat. Ent. Soc.*

EDITED by B. R. STALLWOOD

AES NOTICE

WHERE TO WRITE

Membership applications, offers of help to : D. OLLEVANT, *8 Salcombe Drive Morden, Surrey.*

Advertisers to : L. W. SIGGS, *10 Repton Road, Orpington, Kent.*

Changes of address and non-arrival of Bulletins *to :* B. L. J. BYERLEY *45 Elmgrove Road, Harrow, Middlesex.*

Offers to lead Field Meetings, exhibit, etc., to : S. M. HANSON, *167 Gunnersbury Park, London, W.5.*

Manuscripts, drawings and books for review to : B. R. STALLWOOD, *49 Southfield Gardens, Strawberry Hill, Twickenham, Middx.*

Subscriptions (12/- per annum, 6/- for Juniors) to : R. W. WATSON, *63 Commercial Road Totton, Southampton.*

Youth matters to : F. C. BROWN *6 Osmond Gardens, Wallington Surrey.*

AES

Members can help the Society in several ways:—

(a) By dealing with advertisers and mentioning the *Bulletin.*

(b) By bringing in new members. Subscription, 12/- per annum. Juniors, 6/- per annum.

(c) By buying AES publications and suggesting Public Libraries should buy them.

(d) By friendly co-operation with other members.

(e) By taking just that extra bit of trouble required to record happenings of note for the *Bulletin.*

A E S BULLETIN No. 176 AUGUST 1955

COLLECTING FLEAS (SIPHONAPTERA)

Insects of this Order have received similar treatment to that accorded to most small insects . . . lack of attention, although their medical importance, in some cases, has relieved the situation somewhat. In actual fact they are easy to collect, easy to store, and, once the Royal Entomological Society Handbook on their identification appears, the British species will be easy to identify in almost all cases.

The British list in respect of this Order includes about 56 species and sub-species, but at the moment of writing two of the sub-species have not yet been described. Most of them should be found in every British county, but there are obvious exceptions, which are limited in their distribution by the distribution of their hosts. Of the others, some are very host specific, but their hosts are spread over most of the country, and others are less host specific and are able to adapt themselves to whatever suitable host happens to be available. As an example of the former we could consider *Ceratophyllus hirundinis* Curtis, which is a parasite of the House Martin, or *Ceratophyllus styx* Roths. from Sand Martins and as a more adaptable flea we could consider *Ceratophyllus gallinae* Schrank which infests many different birds and especially the Passerines. It is quite obvious, therefore, that the collection of a fully representative collection of the fleas of any area means that the birds and mammals of the area have to be known and either the animals themselves or their nests obtained and examined. During this process other ectoparasites are frequently found and should be preserved for examination by the appropriate specialists.

Collecting from nest or hibernacula material depends upon the apparatus available to the collector. A Berlese funnel can be used, but the immature stages are often killed, and they cannot be reared. For small nests I use a narrow-bladed scalpel or penknife, a spare tin, a large sheet of white paper and the tube into which the specimens are placed. The nest, in the tin used for original collection, is placed in the middle of the sheet, opened, and a very small amount of the nest material removed. This is shredded over the paper, fleas that appear are caught on the dampened blade and popped into the tube which contains 70% alcohol. In the meanwhile the tin lid has been replaced. When there are no more fleas to collect from the material, it is tipped into a spare tin and a further sample of the nest removed for examination. This continues until all the nest has been searched and transferred into the spare tin. A drop or two of water are added to keep the atmosphere damp and the lid replaced and sealed with selotape. Larger nests are dealt with in the kitchen sink. This receives about one inch depth of water, a small stand placed in the centre and the nest containing tin placed on the stand. The lid is removed and the shredding process carried out over the open tin. Unless the tin contains a vast number of fleas the lid need not be replaced, as everything that hops out lands in the water where it is trapped. As before, shredded material is transferred to a spare tin and the fleas, collected from the water surface by the scalpel blade, are put in the alcohol tube. Each sample of nest material should be examined at least twice.

Collecting from the animal means catching the animal first. The smaller rodents can be easily caught by nipper traps, slightly larger animals such as grey squirrels can be shot (and their tails collected as well as their fleas) and for a supply of the bigger animals, badger and fox, the the kindness of local farmers must be sought. The apparatus this time consists of a supply of cloth bags of various sizes suitable for the animals it is hoped to obtain, a large tin, some chloroform or ether and tubes of alcohol. In all cases the dead animal should be moved as little as possible before being placed in the bag so the bag, widely opened, is placed on the ground by the body which is gently moved into the bag. This is then closed with string or an elastic band,

and, later on, placed in the tin and a few drops of chloroform or ether added. A few minutes later on the bag is removed from the tin and can be emptied on to a sheet of white paper and the fleas tubed. The seams of the bag should be examined, not only to make a maximum collection, but also to prevent contamination of future collections, and the fur or feathers of the animals brushed to and fro to find any fleas which did not leave the body on death. Mention of birds reminds me that collectors must observe the provisions of the Protection of Birds Act, 1954, and obtain a permit before they start killing a variety of birds. Permits under this Act are issued by the Nature Conservancy. Fleas leave bird bodies very rapidly after death, and they must be bagged without any delay whatsoever. Mammal fleas tend to stay on the bodies considerably longer, but the length of stay seems to be shortened by high air temperature. Consequently traps must be examined as soon as possible after dawn. As many small rodents start moving and feeding actively in the evening, another examination should be made about dusk. I find that it is rare to take small rodents during the mid-day, although it is not unknown.

Large animals cannot be bagged conveniently, but they can be wrapped in newspaper and then hung over a bath of water when at home. The fleas will drop from the carcase into the water and can then be collected with ease. The newspaper wrapping must be examined before it is discarded.

I always use a separate tube for each host, in almost all cases the $1\frac{1}{4}$ inch $\times \frac{5}{16}$ is plenty big enough and I have one in front of me now which contains 800 specimens of *C. hirundinis*. The preservative used is always 70% alcohol. Formalin is NEVER used as it prevents satisfactory microscope slide making of the specimens. In every tube there should be a label giving all the data; locality, host, date, collector, ecological data if of interest, identification of the contents. The data labels should never be on the outside of the tube. Information can be written in pencil or, preferably, Indian ink. Care should be taken over the paper used as I find that certain papers are made with a size that is easily displaced by the alcohol and appears as a fluffy sludge in the tube.

Mounting the specimens as microscope preparations involves a number of stages which can be summarized as follows:—

(i) Immersion in 20% KOH solution until the fat contents of the body have been dissolved, care must be taken not to overbleach the specimen.

(ii) Distilled water for one hour. If hard water is used deposits of potassium compounds may appear; they may, but may not vanish in the next process.

(iii) 5% aqueous solution of glacial acetic acid for half an hour.

(iv) Two immersions in distilled water, one hour.

(v) Place the specimen on a clean slide, carefully arrange the legs, using two very fine needles with the aid of a powerful lens. Put on a coverslip and run absolute alcohol under the coverslip from a small pipette. 95% alcohol or dehydrated meths may be used. Large fleas must be covered by half a slide as the pressure of a coverslip would be insufficient. Leave for half an hour.

(vi) Place in absolute alcohol for an hour at least.

(vii) Place in oil of cloves until they sink, at least a day.

(viii) Place in xylol (twice); about ten minutes.

(ix) Mount in canada balsam dissolved in xylol. The flea should be centrally placed on the slide, on its right hand side, with its back towards the worker. Only one specimen should go under one coverslip,

(x) Dry the slides in an oven at 80°-90° C. for about half an hour. Regulo Mark ½ does well with a gas oven.

(xi) Label the slide.

The literature of this group is scattered in many journals and much of it is very difficult to obtain. A small general book is *The Flea*, Russell, H., 1913, C.U.P., at 6/-. The only published key to the British species is by Rothschild, N. C., *Ent. mon. Mag.*, 1915, but this is almost unobtainable. A new key is being compiled by Mr. F. G. A. M. Smit and in the meanwhile his *Lopper*, G. E. C. Gads Forlag, 1954 (this is a key to the Danish flea fauna), serves admirably as there are few differences between the flea lists of Denmark and Great Britain. Embryology is dealt with by Kessel, E. L., 1939, *Smith-*

sonian Misc. Coll., **98** (3), and skeletal anatomy by Snodgrass, R. E., 1946, *Smithsonian Misc. Coll.*, **104** (18). A most useful bibliography is in Costa Lima, A. da, 1946, *Monografias do Instituto Oswaldo Cruz*, **4**. *Fleas, Flukes and Cuckoos* by Rothschild, M., and Clay, T., 1952, Collins, is a most useful book which should be owned by everyone interested in bird parasites.

I shall be delighted to attempt the determination of specimens obtained by members or to receive nest material from which fleas can be extracted. Though the general British distribution of most of our species is fairly well known there are plenty of gaps and these can only be closed by much more collecting.

R. S. George (1402).

PRACTICAL HINTS — August

August, the month for holidays, sugaring and beating for larvae. Probably more people beat and search for larvae this month than during the rest of the year; why? Because they (the larvae I mean!) are fully fed and near pupation, thus producing moths with the minimum of labour—apart from that expended in the actual process of obtaining! Also, there are a goodly number of species in the larval state at this time.

Young Larvae. The trouble some folk go to with larvae just hatched is amazing. Glass topped tins, glass jars with pieces of glass on top, etc., etc. Some species must be started in this way but tree feeders do not require anything more elaborate than a glass bottomed collecting box. The method: Size of box is dependent on the species and number. Make a *small* hole in the flange of the box as near to the 'shoulder' (where the box and lid meet) as possible. Insert the stalk of the foodplant through this hole, transfer the infants with a small camel-hair paint brush. Should your moth have laid her eggs on the blotting paper with which you should have lined the 'laying box', you can transfer the whole lot, cutting off surplus paper first, of course. The box is then stood on a small jar containing water. In this nursery your babies will thrive, and in some cases need no attention for a week. As they grow larger boxes may be brought into service until such time as they can be safely housed in a larger breeding cage.

Colias croceus Fourcr. (Clouded Yellow). Keep an eye on the clover and lucerne fields this month, in case we get an influx of this migratory species.

Hesperia comma Linn. (Silver-Spotted Skipper) will be on the wing this month. Chalk-hills are its favoured haunts, and the area around Box Hill, Surrey, is a good locality.

Moths on the wing this month include:—*Campaea margaritata* Linn. (Light Emerald), *Pseudoips bicolorana* Fuessly (Scarce Green Silver-Lines), *Orgyia antiqua* Linn. (Vapourer), *Acasis viretata* Hb. (Yellow-Barred Brindle), *Pheosia gnoma* Fab. (Lesser Swallow Prominent), *Lophopteryx cucullina* Schiff. (Maple Prominent), *Stilbia anomala* Haw. (Anomalous). Search the flowers of Ragwort early in the evening for this species.

Ragwort, particularly when grownear near the sea, will often be worth a visit after dusk. Tilt the whole flowerhead over the net before switchin on the torch, otherwise many insects will drop off into the grass and be lost.

R. V. Aldridge (262).

THE 1955 JUNIOR MEMBERS NUMBER

The November issue of the *Bulletin* will, it is hoped, be written entirely by Junior Members. This scheme, which was first tried out in 1953, has proved only partly successful, and we have not yet managed to get 100% of the articles and other contributions by Juniors.

There must be many of our younger members who have interesting information and ideas which they could pass on to others, and a number who have expressed the wish to help the Society could well do so by contributing to this issue.

As it is my first year as your Youth Secretary I should be extremely pleased to see a bumper *Bulletin* full of useful suggestions and tales of entomological experiences—funny or otherwise. I shall probably never have the chance to meet you all, but our interests are the same, so do write about them and give the rest of us the benefit of knowing you through your writing.

Material for the *Bulletin* should reach the Editor by the 12th September, 1955. Drawings should be in black Indian ink on white paper, and should be twice the size they would

appear if used in the *Bulletin*; that is 4½" wide for reduction to single column width.

F. C. BROWN (2414),
Youth Secretary.

LIGHT ON THE STOEP—AND ON THE SUBJECT

Before embarking on the mainstream of this article I should like to make some sort of apologia for my continual appearances under other people's headings.

I have noticed how frequently questions are posed in articles in the *Bulletin*, or, if not actually asked, implied. Some of these may be rhetorical, and asked just in order to make readers think about a subject for themselves, but I cannot help feeling that most of them are really asked in hope of an answer. In any case, some sort of an attempt should be made to answer such questions, *whether rhetorical or genuine*, in order to fulfil the obligations implicit in our Objects. These replies should be given due publicity in subsequent *Bulletins*, so as to avoid leaving questions in mid-air, and readers groping for solutions. This is not a criticism of editorial methods, but of the laziness, or lack of confidence of members unwilling to move themselves, and "stick their necks out" in an attempt to help their fellow-members.

I have noticed also how few questions *are* actually answered, even partially, in the *Bulletin*, and, although I realise that some may be answered by members writing direct to the questioner, I feel that, for the reasons indicated in my last paragraph, this is not enough. In fact, my own experience lends support to my argument: I have rarely been written to by anyone trying to answer *my* questions, and, although a few rare exceptions have borne fruit (sometimes a very unexpectedly heavy crop!) most of my published questions have been quite sterile of published replies.

I have therefore been goaded into an attempt, made at the risk of gaining a reputation as a self-opinionated know-all, to set an example to my fellow-members in doing my best to help *them* out of the sort of morass in which I have so often found myself floundering—and, incidentally, continue to do.

Come along, then, my colleagues of the net and the beating-tray! That little bit of relevant knowledge or experience may be an enormous help to somebody else, and will probably elicit more information, some of which will be useful to *you*. In any event, what you write is sure to be of some use to some one (maybe to yourself, as it will probably be taken up if controversial!), and can do little harm. If you say nothing, you are only hiding your talents, and will never even know whether it is legal currency or counterfeit; whereas, if you speak up, at worst you will find out that you have been wrong (which is a good thing to do), and at best, you may be able to contribute materially to human knowledge.

And now, having got that lot off my chest, I will try to answer a few more questions, this time put by Mr. A. H. Newton (*Bull. amat. Ent. Soc.*, **13**, 96-98).

Firstly, evolution never treats anything badly. It is a quite automatic process by which, by virtue of the perpetual variation of all strains of living things (and, incidentally, non-living things), certain of their variations are eliminated by succumbing to adverse environmental factors. The remainder may survive and either stagnate, when a slight change in environmental conditions exterminates them, or continue to produce variations, some of which may be even better suited to a successful fight against their environment than their ancestors. Thus, while a certain sort of variation, such as the convex back and thick armour of a beetle or a tortoise, may confer upon its owner an excellent protection against one sort of enemy (in this case large-sized predators), that same variation may bring with it a host of minor but none-the-less uncomfortable snags (gravitational instability and consequent vulnerability to attacks by ants, mites, ticks, etc.).

There are two other factors to be considered. First, the selection of a particular variant by the environment may "trigger off" a genetical process which gives rise to a trend in the form of the individual (the "phenotype") which in its early stages is beneficial, but as it progresses, may become lethal. Examples of this process, functionally related to the armour of beetles and tortoises, may have been the great armour-plated Saurians like *Triceratops*, or the extinct fishes, the Placodermi and Ostracodermi. Secondly, and related to the last factor, it may be (and often is) that an evolutionary line which was selected by some adverse

environmental factor, such as an enemy, long in the past, has persisted up to the present day, while the enemy itself has long since vanished or turned its attention to other victims. This fact is often overlooked, especially by opponents of the process which has been very badly named "Mimicry". They argue that, because a "mimic's" major enemies are invertebrate (in the case of insects resembling vertebrates in aspect to human eyes, and therefore, possibly, to other vertebrates' eyes) and these invertebrate enemies cannot possibly perceive the resemblance, it would be functionless anyway. To my mind, the fact that such a "mimic's" principal enemies *are* now invertebrate bears excellent witness to the efficacy of the resemblance to a vertebrate as a protection against vertebrate enemies.

It is a very humiliating thought that we, like other living things, *and* like non-living things, survive solely as a result of the ability to avoid destruction which is conferred upon us by our structure and its mode of functioning.

As for the frogs which were attracted to light, it is highly unlikely that the brain-structure of a frog would allow it to know, *i.e.*, to be consciously aware, that it would find insects near a light, as harmless lights of sufficient brightness to attract insects are rare in that part of Nature unassociated with Man. For the same reason, it is even less likely that phototropism in frogs would have been preserved by natural selection on account of its dietetic advantages. What is far more likely is that frogs are like so many other animals that rely principally on their sense of sight (including Man). To *any* animal, a stimulus which has any meaning at all for the animal will have either an attracting or a repelling effect, both of which will be instinctive at first. I cannot think of any case (except, perhaps, navigation with respect to a light or a landmark) in which an animal gains by keeping "side-on" to a directional stimulation. With bright lights, then, animals to which illumination is an advantage will tend to be positively phototropic, whereas those that normally shun bright light (because otherwise they would soon fall prey to enemies) tend to be negatively phototropic. I have heard several reports of cats being attracted to M/V and other light-traps, and what driver has not noticed when driving at night that he has to make a conscious effort to pull himself (and the car!) out of the oncoming headlights?

As for the effect of moonlight on numbers of insects attracted to light, it may be that there is some other factor involved, but regular analysis of light-trap records suggests very strongly that the smaller numbers caught are a result of the reduction in *contrast* between light-source and background, caused by the general illumination by the moon-light. I have myself noticed that, on full-moon nights, the only insects I have taken at my bedroom light have come in when the moon has been blotted out by heavy cloud. There are, moreover, many exclamatory reports of large numbers of moths taken at sugar, ivy or honey-dew on the brightest moon-lit nights.

To all those interested in, or merely puzzled by, the effects of lights on night-flying insects, may I enthusiastically recommend an informative paper by Messrs. H. S. and P. J. M. Robinson, published in 1950, *Ent. Gazette*, Vol. I, No. 1, and entitled "Some Notes on the Observed Behaviour of Lepidoptera in Flight in the Vicinity of Lght-sources, together with a Description of a Light-trap Designed to Take Entomological Samples".

Have Mr. Newton, or any other of "our exotic Members", tried other methods of collecting used in our own more gentle countryside, or are they too hazardous for the Tropics? I refer, of course, particularly to "sugaring", pupa-digging, and "beating".

PETER G. TAYLOR (719).

FRESHWATER ECOLOGY AT MALHAM TARN

From the 18th to the 25th of August, 1954, two AES members, T. H. Pennington (2315*) and R. Underwood (2338*) attended a course on Freshwater Ecology at Malham Tarn, Yorkshire. Although not primarily entomological, this course introduced us to many interesting aquatic insects.

It is perhaps best to give short accounts of the most interesting of these; it is hoped that they will give the reader an idea of the extremely varied and interesting insect life of the Tarn and its surroundings.

In the Plecoptera (Stoneflies) two genera were found, *Perla* and *Nemoura*. Nymphs of these were found in Gordale Beck, a swift-flow-

ing stream in which many interesting captures were made. No adults were found, these only living for a few days.

Four different types of Mayfly (Ephemeroptera) nymphs were found in the beck. These were flat nymphs living in strong currents, burrowing nymphs, swimming nymphs and creeping nymphs. Two genera found in the first type were *Heptagenia* and *Ecdyonurus*. The *Ecdyonurus* nymph was extremely broad and flat with very large limbs, being specially adapted for clinging on to stones. In the second type, burrowing nymphs, the genus *Ephemera* was found. These live in tunnels which they make in sandy mud near the edge of the stream. Swimming nymphs found were all members of the genus *Baetis*; the other genus of Mayfly nymph found was *Ephemerella*, a creeping nymph.

Among the water bugs we discovered *Corixa striata* Linn. (Gordale Beck), *Velia currens* Fabr. (Gordale Beck) and *Micropecta poweri* D. & S. (the North rocky shore and East Sedge Beds of the Tarn). Young specimens of *C. striata* were found in the East Sedge Beds.

Perhaps the most interesting Order which we studied was the Trichoptera (Caddis Flies). Both case-building and web-spinning larvae were found. A genus included in the second category was *Polycentropus*, which builds a silk net something like the shape of a swallow's nest with the opening facing the current. Another caddis which does not make a case was *Tinodes*, adult specimens of *T. waeneri* Linn. being found in the boat-house on the north shore of the Tarn.

Many case-building larvae live in the Tarn and the streams flowing into it, such genera as *Hydroptila*, *Rhyacophila* and *Limnophilus* being found.

A rare caddis, *Agrypnetes crassicornis* McLachlan, occurs at the Tarn, but we were too late in the year to see the adult stage in flight.

Quite a few genera of aquatic beetles occur at Malham, both common and rare species being found. Genera which we recorded included *Platambus*, *Deronectes*, *Helodes*, *Haliplus*, *Macroplea* and *Helmis*. One or two specimens (cocoons and adults) of the rare water beetle *Macroplea appendiculata* Panz. were found in the Tarn. This insect, in the adult stage, clings to the roots of *Potamogeton* (pondweed); it was only found by examining the roots of pondweed which we took from the Tarn.

Our observations of the aquatic Diptera were entirely concerned with the larvae. *Chironomid* larvae were universally found, some of the large red *Chironomus* larvae also being seen. Larvae and pupae of *Tipula* were seen on the North rocky shore, *Dixa* larvae also being observed in the Tarn (East Sedge Beds).

The well-known Phantom larva (*Chaoborus*) was found in the Acid Peat Pools on the Tarn moss. The long cylindrical body of this larva is completely transparent, the only easily visible structures are the black eyes and two pairs of air-filled hydrostatic organs, one at either end of the animal. *Anopheles* pupae were taken in Gordale Beck.

Another well-known dipterous larva found was that of *Simulium*, which also occurred in the Beck. This larva can make silk threads, and if it is displaced by the current it will let out a 'life-line' and eventually climb back along the thread to its original position.

In conclusion, I should like to thank Mr. P. F. Holmes, M.A., Warden of the Centre, who conducted the course, for giving us much useful information and help.

T. H. PENNINGTON (2315*).

MORE ON HAIRWORMS

I can add just a little to Mr. H. K. Airy Shaw's note (*antea*: 37-38) concerning these endoparasites.

Two hairworms have been brought to me by my pupils, but unfortunately I find that I have failed to keep exact notes of the occurrences. As some small consolation I have sent both specimens to the British Museum (Natural History) where they have been examined by experts.

The first, sent to the B.M.(N.H.) on 14.v.53, was determined by Mr. S. Prudhoe as *Parachordodes pustulosus* (Baird) (Nematomorpha, Gordiidae), Maisemore, Glos., B. R. Elkins, found whilst washing a lettuce from the garden. The second Mr. W. G. Inglis determined as a mature female *Mermis nigrescens* Dujardin, found in a vegetable garden, Glos. 11.vii.53. My note of the finder's name is missing. In each case the worm was free from its host and both finders, being unaware of the host/parasite relationship, made no search for the host.

R. S. GEORGE (1402).

LETTERS TO THE EDITOR

MR. ALFRED LAURANCE

From J. C. Nott (1913)

With reference to the Obituary notice concerning Mr. Alfred Laurance, *Bull. amat. Ent. Soc.*, **14**, 27, the two statements in the first paragraph, must, I am afraid, be discounted, owing to lack of corroboration.

THE PURPLE EMPEROR—AND THE ATTRACTION OF WHITE CLOTH

Peter G. Taylor (719) writes:—

With reference to Mr. L. W. Siggs' letter (*Bull. amat. Ent. Soc.*: **13**, 114) I should like to quote the Rev. William Kirby, Rector of Barham from 1782 to 1850, who wrote, in the early 19th century, as follows:—

"A table-cloth spread on the grass in the open parts of a wood I have known allure several scarce insects: a lady's white dress is equally attractive".

This passage is quoted by Mr. P. B. M. Allan in "A Moth-hunter's Gossip", with especial reference to the capture of the Purple Emperor, and Mr. Allan's comments and embellishments are, as usual, highly entertaining. Thus it seems that, although white nylon was unknown even 50 years ago, the general method was known nearly 150 years ago, and Mr. Allan had foreseen and suggested its application to the capture of *Apatura iris* Linn. at least 18 years ago.

Surely this does not mean that there is a lepidopterist—and an experienced one like Mr. Siggs—who has not read all of Mr. Allan's "Moth" books at least three times?

To be more serious for a moment, I should like to suggest that the attraction—to *some* insects, at least, including *A. iris*—of white cloth is of a kind with the attraction of aquatic, flying insects for the polished bonnet of a car, or the shining glass roof of a green-house. Quite a number of instances of the latter have been recorded lately, including several cases where eggs, normally laid in water, have been deposited in such lethal situations. It would appear that the "releaser" (to use Lorenz's term) for (i) settling and (ii) oviposition is quite simply the sighting of a bright, smooth surface, with the addition, for (ii), of contact with a surface.

It is well known that *A. iris* is wont to come down to drink from puddles, and it probably locates these by a simple response to a sky-reflecting surface. A white cloth would probably appear very similar even to the eye of a Purple Emperor.

REVIEWS

The London Naturalist. Journal of the London Natural Hstory Society, 1954, No. 34. 186 pp. + Supplement; 8 plates. Price 7/6, or complete with Bird Report 11/-.

The value of local lists has been a debatable subject for many years, the question of what to put in, and what to leave out. Of course, the ideal would be a detailed record of exact localities, but many entomologists are naturally chary about giving away the whereabouts of scarce species in case they should be exterminated by less conscientious collectors. Therefore a compromise usually comes about by giving approximate localities only, particularly for uncommon species, and far too often summarily dismissing the abundant ones as "common everywhere", giving the impression that they are evenly distributed and common over the entire county, or smaller area, under consideration.

This is often far from true as no doubt many collectors have found, particularly with species such as the Common Blue, Meadow Brown, Small Heath and Small Copper.

More details then, of our common species can surely be given in local lists, of their *local* distribution and ecological requirements, without fear of their being wiped out, and thus furnishing a more accurate scientific record for future entomologists to consult.

The four excellent local lists of butterflies and moths in the book under review, go a long way to provide this information. They deal with the butterflies of Wimbledon Common and the North West Kent Marshes, the macro-lepidoptera of Bookham Common, and Dr. C. G. M. de Worms's "Moths of London and its Surroundings". All four are very useful in the reviewer's opinion, giving, in combination, times of appearance, habits, types of habitat, and, in the case of the Wimbledon list, details of flowers visited for nectar, a much neglected subject.

Baron de Worms continues his list in this issue by dealing with the Agrotidae. For dipterists, E. R. Nye describes the Culicidae of the London Area, which includes a Key to the species, and the fishes, amphibians, reptiles and mammals of Woolwich are discussed by R. G. Rigden.

It is good to see ecology featuring so largely, and with the Progress Report of the Survey of Bookham Common (13th year) the flora and fauna of the bomb-crater ponds and gun-pits are considered; and other articles include botanical lists, notes on climate, geology and other subjects in relation to the London Area; book reviews, etc.

A minor criticism is that in the compiling of the book, the grouping of subjects could with advantage be improved, to avoid, for instance, sandwiching a botanical article between two entomological ones. Nevertheless the contributors and members of the L.N.H.S. are to be congratulated in producing a useful, inexpensive and well written volume.

R. S.

•

Evolution of an Insect Society. By Derek Wragge Morley. 1955. 211 pp., 31 plates. George Allen & Unwin, London. Price 18/-.

To the entomologist who has not made a special study of ants, the Wood Ant (*Formica rufa* Linn.) is perhaps the most attractive British species, mainly due to its noticeable size and habits. The large nests of this species are part of the heath and woodland scene, particularly in Surrey and Hampshire.

Derek Wragge Morley, through years of patient observation, literally takes the reader down into these ant cities to watch the small inhabitants perform their daily tasks, and he uses this specialised social species as an example of evolutionary development.

The author first describes a commune of Wood Ants (i.e. an aggregation of several friendly nests that have sprung from a mother nest) then he traces forward the origins of their behaviour from the days of their primitive ancestors, that were almost individual in habit, and lived in very small colonies of a dozen or so. For the sake of illustration he uses existing and related tropical species of similar economy.

The evolution of the Queens; and of the grubs from the primitive type that were mobile, and were capable of feeding themselves, to the specialised that are helpless and wholly dependent on the worker ants for sustenance, is fully described, also, the manner in which the work of a modern colony is apportioned among its individuals.

The story makes fascinating reading, written in a modern style and free from any anthropomorphic outlook, which is difficult when describing the habits of any social animal.

The author concludes by saying "We should not attempt to compare the social behaviour of ants and men, yet it may well prove that we can learn something of the simple basic mechanisms of society, by studying their societies rather than our own. As long as we maintain that a society functions either by predestination or else think of it in simplified human terms as we do in the case of the primitive societies of the apes, then we shall learn little from our studies of animal societies. We are merely burking the issue. Instead of seeking to study social mechanisms we are attempting to find similies of our own sophisticated behaviour. When they cannot be found we imply predestination and say, it is ordered so!"

There are numerous and excellent close-up photographic illustrations in monochrome, showing various incidents of the Wood Ant "way of life" and diagrams of nests and communes, but with regard to these diagrams it seems a pity to go to the expense of producing them as photographic plates when they could be shown equally well as line drawings in the text.

The reviewer is also of the opinion that giving the various species of ants English names tends to confuse, rather than help, the reader. Constant references to Jet Black Ants, Large Black Ants, Black Lawn Ants, Janitor Ants, Harvesting Ants, Bulldog Ants—to name a few—are far more difficult to remember than *rubra*, *rufa*, *fusca*, etc., but no doubt many people will disagree on this point.

In summary, the book is a useful contribution to the study of animal behaviour, and at the same time a story of interest, to general entomologists as well as specialists in ant lore.

R. S

Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. 1955.

A Glossary for the Young Lepidopterist -	6d
Label List of British Macro-Lepidoptera -	1s 0d
Check List of British Macro-Lepidoptera -	3d

AES Leaflets

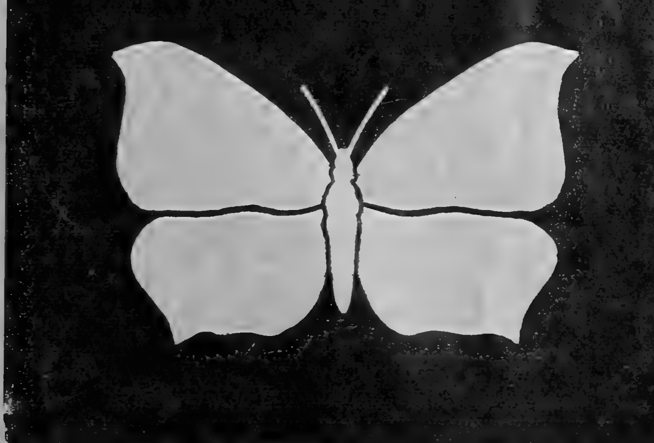
No. 1.	Collecting Coleoptera	3d
3.	Rearing Silkworms	3d
4.	Collecting Sawflies	6d
5.	Collecting Flies (Diptera)	2s 6d
6.	Collecting Beetles associated with Stored Food Products	1s 6d
7.	Some Improved Devices for Rearing Hymenoptera	6d
8.	Collecting Ants	6d
9.	Collecting Caddises	1s 0d
10.	Experiments with Bees	6d
12.	Collecting Dragonflies	6d
13.	Collecting Microlepidoptera	3d
14.	Setting Microlepidoptera	3d
15.	Collecting Heteroptera	6d
18.	Collecting Clearwings	6d
20.	Preserving Caterpillars	1s 0d
21.	Collecting Psocoptera	6d
22.	Collecting Lacewings	1s 0d
23.	Collecting Centipedes and Millipedes ...	6d
24.	Entomology of Bird Pellets	1s 6d
25.	Collecting Bumble Bees	2s 0d
26.	Collecting Collembola	1s 0d

When 12 different leaflets are ordered a deduction of 10% from the total cost is allowed.

All these publications are obtainable from the Honorary Publications Secretary, C. BIGNELL PRATT, 1 WEST HAM LANE, LONDON, E.15. A remittance must accompany the order and sufficient to cover postage must be included. Postage on one leaflet is 1½d, on one volume 2d.

VOL. 14
No. 177

EMBER - - 1955



THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

World List abbreviation : *Bull. amat. Ent. Soc.*

EDITED by B. R. STALLWOOD

AES BULLETIN

No. 177

SEPTEMBER 1955

THE LEAF-OWL MOTHS

In the family of Saturniidae (generally known as silkmoths) there is a genus named by Hübner *Automeris.* Seitz's *The Macrolepidoptera of the World* recognises 170 species and a good deal of subspeciation: they range throughout both the Americas, but are in the main to be found in the tropical and sub-tropical zones of Central and South America. The only species commonly known to English-speaking entomologists is *Automeris io* Fabr., the "Io moth" of U.S. school textbooks, or the "Bull's Eye moth". The second popular name alludes to the archer's target rather than to the animalian eyes, which the markings on the hindwings of almost all the species mimic.

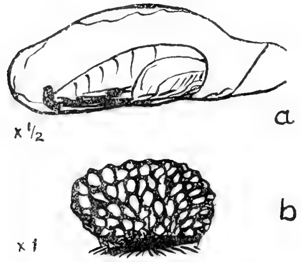
I have been permitted to give a little semi-skilled assistance in bringing together the representatives of this genus from the various collections and store boxes in the British Museum (Natural History), so that I have acquired a certain familiarity with a high proportion of the species. Moreover, through the co-operation of Señor Walz and other AES members, I have in the last two years been able to rear, study and paint not only *A. io* but also *A. aurantiaca* Weym., *A. coresus* Bsdv., *A. illustris* Wkr. and *A. memusae* Wkr., all of which will be fully described in the forthcoming revised edition of the *Silk Moth Rearer's Handbook*.

Popular names are seldom satisfactory and are always quite unsuited for international correspondence; but having seen these moths both alive and set, if I wanted a memorable English name, I should call them the "leaf-owl" moths. In all the species the forewings are cryptic and I suspect that they all rest (as all the living ones I have reared do) with wings streamlined back from the thorax and at an angle pent-house fashion. In this position they are indistinguishable from a pair of withered leaves. It is characteristic of the genus that there is a line running from the apical angle to the base of the forewing. In most species it is darker than the ground colour and appears to be the mid-rib of the leaf: in some species a higher degree of mimicry is obtained by the line being doubled, a bright line running parallel with the dark line. A few feet distant, the appearance of a raised rib throwing its own narrow shadow is perfectly simulated. In the discal area there is either a minute transparency, simulating a perforation, or a dusky discoloured area, very like the work of a leaf-miner or a patch of mould or fungus. Many species, in particular *A. aurantiaca*, have an additional refinement—a bar of white superimposed on the thorax above the wing base. This gives a perfect representation of a gleam of light separating the "leaf" from the "stem".

When the species I have reared are disturbed they drop to the ground where they remain motionless, but with the forewings raised clear of the hindwings. These rearwings are brightly coloured either over the whole area or in the outer half; and in the centre of each is a pattern closely mimetic of an eye, usually complete down to the detail of a dash of white like a reflection from the curvature of an eyeball.

In falling to the ground, the moth would in nature blend with other fallen leaves in respect of its forewings: but the staring eyeballs on either side of the abdomen would give the vivid impression of an owl's face. In *A. aurantiaca* versimilitude is increased by the fact that the abdomen is rigidly humped into a curve which reveals the honey-coloured chitin between the segments and becomes startlingly like the horny curved beak of an owl. Hence the double name, descriptive of the double protection.

The cocoons of this genus are also worthy of remark. In general they are of a dark-brown silk, woven with an openwork texture among curls of bark, dead leaves on the ground, or leaves on the tree. I suspect that in nature the bark-using species actually spin between loosened bark and the tree itself as often as among ground débris. But the emerging moths are apparently not equipped with sawing tools or solvent fluids as other genera are and must rely



Automerid cocoon.
(a) in section (b) the portcullis.

mainly on physical pressure to force a way out of a cocoon, which cannot therefore be hermetically sealed. Other Saturniidae, notably our one British species *S. pavonia* Linn. (the Emperor moth), have met the problem of preserving an exit while preventing marauding entries by a valve device of stiff, outwardly pointing threads, often erroneously described as a lobster-pot. The larger species of *Automeris*, such as *A. janus* Cr. and *A. coresus*, create an obstacle the like of which I have not seen elsewhere except in the invisible world of microscopic water creatures. They produce an obstruction which combines the likeness of a portcullis with that of a draw-bridge. The figure shows at (a) a section of a stylized cocoon with side-view of the portcullis in position. It will be seen that pressure from outside inwards would only jam the valve more firmly in position: but when the moth emerges its forward pressure causes the valve to fall like a draw-bridge. The figure also shows at (b) an upright view of the portcullis, the bottom of which is flanged with flexible silk glued to the inner base of the cocoon. How the pupating larva stiffens the major part of the portcullis to a horny consistency while leaving the many ventilation holes is among the myriad mysteries that the naturalist constantly comes across.

W. J. B. CROTCH (1181).

DEFENCE BY STARTLING

The article under this heading by Mr. A. L. H. Townsend (1691) (*Bull. amat. Ent. Soc.* **12**: 85), besides being very gripping and informative, raised some interesting questions. It is a pity that he suggested that insects *"believe"* in a method of defence. I doubt very much whether insects "believe" anything, except, maybe, the messages concerning the simple organic needs and situations that their senses pass to them: much less a subtle psychological concept such as that.

As for the questions, I should like to attempt to answer some of them. First, how mimics arise: presumably, the success of any protective appearance must depend on two principles:—

(i) that the impression produced *in the eye of the mimic's enemy* must be confused *by* that enemy with the appearance of an enemy of its own; and

(ii) that the enemy, to be confused at all, *must* have had some sort of experience of its own enemy, or possess an automatic, inborn fear mechanism called forth by such an appearance, such as the reaction of goslings to a short-necked bird-shape like that of a bird of prey.

Thus, no matter what the animal, its passive shape, and possibly colour also, will confer upon it an advantage over its fellows, if it fulfils (i) above. It and its progeny will therefore tend to survive at the expense of *their* fellows, and gradually will oust them from dominance. If the animal in question resembles, quite by chance, a vertebrate enemy of one of its own enemies, then, without any further connection, there will be a tendency for its offspring to approach that resemblance even more closely. It *may* "stagnate", or remain the same (though this is unlikely, as living things are constantly varying from generation to generation) in which case we will be none the wiser. It may, on the other hand, vary *away from* more exact resemblance, but such variants are more easily spotted by enemies, and are therefore gradually wiped out. Variants may arise which, once again quite coincidentally, resemble their unconscious "model" even more closely, and those will once again survive at the expense of their less perfectly-protected fellows. Hence the tendency to approximate to the "model".

If one substitutes "noxious creature" for "enemy" one has the case for protective resemblance to such creatures also. This is the more obvious type of mimicry.

Now, for a variety of reasons, all pretty well known, the group of animals to become "dominant" (i.e., most versatile and least vulnerable) or most successful, in recent geolo-

gical time has been the vertebrates, and, of these, the mammals. Therefore, the sort of appearance most likely to frighten the largest number of predators nowadays will be that of a vertebrate, and more especially of a mammal. But, owing to the geologically recent origins of land vertebrate (in the Permian) in comparison with the age of insects and insect-like forms, it is hardly surprising to find that, say, insects mimic other insects more precisely than land vertebrates. Similarly, as mammals are a relative novelty among land vertebrates, they are even less exactly mimicked. That the resemblances to vertebrates are, nevertheless, pretty close is easier to understand when we remember that insects usually have at least one generation a year, while vertebrates usually have less, and in many cases much less. This gives invertebrate mimics an enormous advantage in the race to "catch up on" their models. It is more remarkable, perhaps, that they should so accurately resemble *invertebrate* "models", which reproduce at about the same rate, *away* from their mimics. (By analogy, imitation can never keep pace with creative genius.) Many of the mammal-mimicking insects are Lepidoptera, which did not, as far as we can ascertain, arise till after the Carboniferous, when mammals arose.

Of course, any "mannerism", by which I mean a small behaviour-pattern, arising in a mimic and making its resemblance still more complete, will be quite automatically selected for survival by more complete avoidance by predators of its possessor.

With regard to size, this is relatively immaterial. Especially in the case of inborn reactions to the appearance of enemies, *shape* is the important thing: if the shape's there, ten to one the enemy will be; if he's a bit small, that may mean merely that he's further away, but still lethal.

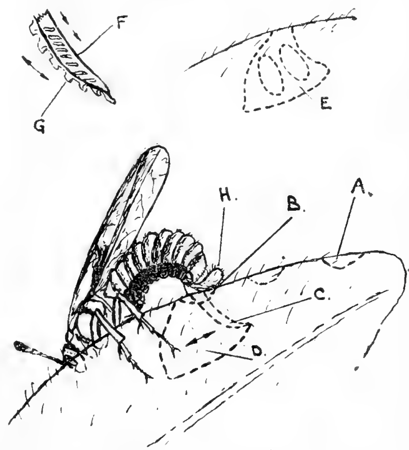
Eyes, being the instruments of the most exact sense, are very important to predators, especially vertebrate ones. They are also, by their very nature, very difficult to conceal. Thus, however cryptic the coloration of a predator, its eyes are its chief "give-away". As a result, eyes tend to mean danger, and are therefore very important to all animals as warnings. Hence the predominance of "eyes" as startling mechanisms, and their efficiency, even to ourselves, and especially to children and primitive people.

PETER G. TAYLOR (719).

OBSERVATIONS ON REARING THE SAWFLY, *ABIA CANDENS* KONOW

During an evening outing in June 1954, I was agreebly surprised to find an adult female *Abia candens* Konow resting on a leaf of a large patch of *Succisa pratensis*. Remembering that the larvae of *A. candens* had not been described, I placed a leaf with the insect in a glass tube, and within a few moments it had taken up a position on the edge of the leaf as if about to commence egg laying. A few more minutes, and it had presented me with two pairs of eggs, neatly placed between the two skins of the leaf.

Inspired by this observation, I potted up a small plant of Devil's Bit Scabious on returning home, and re-instated the insect on a leaf. By the aid of a strong light behind the leaf, and a lens to enlarge the details, I was able to witness the whole rather complex procedure of egg laying.



Abia candens. Method of oviposition.

The female, grasping the edge of the leaf, arched its abdomen, and, drawing down the outer sheaths (H) one on each side of the leaf to act as guides, inserted the saw. The actual cutting operation was performed by the inner saw (G) reciprocating between the outer cases (F). There were two trial insertions (A), made to a depth of about 2 mm, and

approximately four times the width of the saw in length. The third insertion proved to be the successful one, and was continued by the saw being forced deeply into the leaf—the inner saw making the initial piercing strokes, and being supported by the outer cases. On reaching the maximum depth (C) the saw was moved forward—the saw edge clearly exposed the outer cases—and formed a pocket (D) between the two skins of the leaf. There was a momentary pause in the cutting action, then the whole apparatus was withdrawn slightly, and the egg slid down into position. Moving forward slightly, the female elongated the pocket a small amount, and laid a further egg. The complete operation of depositing two eggs took approximately 10 minutes. Most of the eggs were laid in pairs in a pocket as shown at (E), but there were exceptions of three to a pocket.

The ova appeared to be fully expanded when laid and measured 2 mm. long by 1·2 mm. broad. After 7 days the immature larvae could be clearly seen complete with legs, but the eyes were not visible until the 10th day (the rest of the egg being crystal clear). The first larvae did not emerge until the 18th day and were uniformly pale slate grey in colour, except for a paler patch round each spiracle, completely hairless on the body, but with slight pubescence on the head. After the first moult the larvae assumed characteristics very similar to those of *A. sericea* Linn. (the other species in the genus).

A description of the final stage features would be:—Head, dark grey to black, shiny with coriaceous surface sculpture, and with dark pubescence about as long as the diameter of the eye on all the head except the frontal area, where it is about two diameters long and much paler. The body is olive green above, and creamish white below; on every segment there is a black spot surmounted by a vertical straw yellow fleck positioned above and slightly in front of each spiracle. The eight pairs of abdominal legs each have very sparse pubescence, and there are scattered hairs on the first and last segments of the body. The dorsal line is devoid of the black spots diagnostic of *A. sericea*.

The larvae, after 5 moults at intervals of about five days, formed a cocoon in the leaf débris similar to that of an Oak Eggar moth. The full life cycle from eggs to adults was approximately 12 months, but there was a large percentage of deaths through "drying out" in the pupal stage, which does not make for accurate measurement of timing.

Further notes made would suggest that *A. candens* prefers a more shaded habitat than *A. sericea*, as there are two distinct colonies of the two species in my district, *A. sericea* occurring exclusively in the "open" site, and *A. candens* in the deeply shaded one. Neither species, as far as I have been able to ascertain, occurs in the other's territory, although the distance between the colonies is not very great.

Lastly, it would seem imperative to have a growing plant for the adults to deposit their eggs in, as a separate leaf shrivels up and destroys the eggs before the larvae appear.

W. E. Russell (1525).

NOMENCLATURE

I have been delving into ancient literature, assisted by my old friend Mr. Priority, a gentleman who changes his coat every five minutes, so that I often confuse him with someone else. It has dawned upon me that something is amiss with the naming of our British butterflies and moths, and that whilst the more classical scholars have been busily, and I may say continuously employing the services of Mr. Priority, the amateur entomologists have gone on using names which are almost all synonyms, and showing an utter disregard for nomenclature which is literally appalling. Here then is an opportunity for some ambitious young entomologists, who by his studies, and the creation of order out of disorder, may yet earn a C.M.G., an O.B.E., or what-have-you, as well as the undying gratitude of his fellow entomologists. I have looked up James Rennie's *Conspectus of the Butterflies and Moths found in Britain*, published as far back as 1832, and here give examples showing how wrong we have been in employing names which have absolutely no standing beyond a short period of a hundred years or so. The correct name to use for each example is shown in parenthesis after the name now in use.

"The Swallowtail" ("The Queen"); "The Brimstone" ("The Primrose");

"Orange-tip" ("The Wood Lady"); "Small White" ("The Turnip")—an ugly and plebeian name perhaps, *but it has priority.* "The Common Blue" ("The Kent Blue"), but Thank Heaven!, "The Chalk Hill Blue" may still retain its primitive name. It is fortunate that the changes required for the moths are not as great as is the case with the butterflies, but remember that "The Convolvulus Hawk" must in future be known as "The Unicorn", and "The Small Elephant" as "The Pig". Mind you! I do not vouch for these names, for there may be much earlier ones than those Rennie quotes, which would of course have prority over such names as "The Turnip", "The Primrose", etc. Drop back a few centuries and who knows what finds await the industrious bookworm. I have not yet tackled the other Orders, but I find that the use of the name "Dragonfly" is entirely erroneous, and that it is a mere synonym for "Devil's Darning Needle", which name has some five minutes priority over "Horse Stinger".

F. C. Fraser (890).

INSECT ORDERS

(*Continued from Vol.* **12**: 88)

Order XII

ODONATA (*Dragonflies*)

With the dragonflies, we come to a well-known Order about which much is written, and whose species are large, colourful and fairly easy to identify. Recent books, with coloured plates, and giving the biology, habitats and times of appearance, are available. The main disadvantage to the average collector of these insects is that their brilliant colours generally fade after death, and ordinary pinned and set specimens revert to a uniform drab colour, unless certain rather tedious (but well worth-while) procedures, such as dissection and stuffing, dehydrating in spirit, etc., are followed prior to setting.

Dragonflies have four almost equal-sized wings, each bearing a pterostigma. The antennae are almost vestigial, and the compound eyes large; the body is long and slender. The male genital apparatus is unique and is situated on segments 2 and 3 of the abdomen. All stages are carnivorous; there are 42 British species, two being recently discovered.

All Dragonflies, with a few exceptions which fly by night, are day-flying insects preferring hot sunny days. Generally they will be found close to water, though some species are of a wandering disposition; *Libellula quadrimaculata* Linn. and others are known to be migrants. Members of the sub-order Anisoptera are very powerful on the wing, and speeds up to nearly 60 m.p.h. have been recorded for an Australian species.

A freshly-emerged adult dragonfly does not attain its final brilliant coloration for a day or two. As in all invertebrates this imperfect state just after a moult is known as 'teneral.' The sub-order Zygoptera are slower fliers compared with the Anisoptera and are easily caught. The adults feed on other insects which they catch and hold between the fore feet while consuming them. Mating may take place either in the air or at rest.

Egg-laying is by one of two methods. Either the eggs are dropped freely into the water (most of the Anisoptera) or else the female makes a slit in the stem of an aquatic plant, and inserts her egg therein. She may crawl completely under water to do this, sometimes accompanied by the male. This method is characteristic of the Zygoptera.

Dragonfly larvae are entirely aquatic in fresh water, and eat all other living things they can catch. To catch their prey the labium has developed into a specialised 'mask' which is normally tucked away under the head. When a suitable prey approaches, this mask is shot out, seizes it and draws it into the mouth. The larvae are generally of a dull, drab colour, and blend with their background. All are rather sluggish, waiting in hiding for prey rather than chasing after it. The larvae of the Anisoptera breathe by means of concealed rectal gills; three cerci are present, and they are in general rather short and stout. The Zygoptera larvae, on the other hand, tend to be long and slender. Breathing is by means of caudal (tail) gills which correspond to the cerci of the Anisoptera; rectal gills are not present. The larvae live for 1 to 4 years and pass through as many as 15 instars. When fully grown the larva crawls out of the water, fastens its tarsi securely to some support, and the adult then emerges.

The classification of the Odonata is mainly based on the venation of the wings. In addition to present-

day insects, many fossil impressions are known.

The Order is divided into three sub-orders as follows:—

I. ANISOPTERA. Hindwing broader at base than forewing, and wings held open when at rest. Eyes large and meeting, or very nearly so, on top of head. This sub-order contains the genera *Aeshna*, *Libellula* and *Anax*, which are amongst the largest and most powerful dragonflies.

II. ZYGOPTERA. Both wings rather narrow at base and approximately equal in size; held over the body when at rest. Eyes rather smaller than in Zygoptera and separated from each other by at least their own diameter. This sub-order contains the smaller and slower-flying damsel flies.

III. ANISOZYGOPTERA. This sub-order combines some of the characters of the previous two, the venation and general wing-shape being similar to the Zygoptera, while the eyes and general body shape are similar to that of the Anisoptera. This sub-order has mainly been created to contain a large number of fossil forms, but it includes one present-day species found in Japan. Fossil specimens of this sub-order are known from England.

(*To be continued*)

BRIAN O. C. GARDINER (225).

LETTER TO THE EDITOR

M.V. LIGHT TRAPS

J. H. JOHNSON (1040) writes:—

It is impossible to allow the attacks on users of m.v. light traps to pass by without comment, although the absurdity of some of the statements is so obvious that to point it out is perhaps unnecessary.

First of all, it is not essential to kill every moth to discover its specific name. Apart from a few exceptional species which are valuable scientific material anyway, a brief glance is enough to identify 99 out of every 100 moths taken in a light trap, even when they are at rest, at least it is enough for a competent lepidopterist with a copy of South's valuable two volumes and normal eyesight.

Secondly, if any type of trap were efficient enough to wipe out any species of insect, agriculturists would be overjoyed. Anyone who thinks any trap will destroy more than a slight percentage of any living creature, even within its range, is out of touch with reality.

Lastly, for an excellent defence of the scientific use of light traps all entomologists should attempt to read Dr. C. B. Williams' paper under the title "Some Notes on Killing Insects for Collections and Scientific Research", *Entomologist* **85**. This answers the problem to the satisfaction of most reasonable people. At least when they have read it they will have some facts which will justify their actions. They can then make up their own minds in an adult manner.

PRACTICAL HINTS—September

Last September I caused several members to pen some letters of criticism to the Editor. However, I again remind members to search Yellow Toadflax in any area where the plant grows in quantity, for larvae of *Calophasia lunula* Hufn. (Toadflax Brocade).

The pretty larva of *Colocasia coryli* Linn. (Nut-tree Tussock) may be beaten from Beech and Oak during September, and those who require *Dryobota protea* Schiff. (Brindled Green) and *Griposia aprilina* Linn. (Merveille du Jour) should lose no time in digging at the roots of oak for pupae. Trees growing in open places, parks, etc., are far better than those in woods or hedgerows. Both species are frequently quite common and easy to find if the soil is gently broken up. When pupa-digging ALWAYS replace the turf and leave the area around the trees tidy. Do this for two reasons. (1) The owner of the property will give entomologists a bad name if they leave parkland looking as if a herd of wild boar had been let loose. (2) By replacing the turf you provide a suitable pupating site for future larvae and one which will be easy to search next time.

'Sugar' should be used whenever possible this month, particularly in coastal areas in the South. Many a rare noctuid has been taken at the sugar patch. Every specimen of *Leucania lythargyria* Esp. (Clay Moth) coming to 'sugar' should be carefully examined since it is very much like the rarer *Leucania albipunctata* Schiff. (White Point Wainscot). The latter species is generally smaller, and the hindwings paler.

Larvae of *Campaea margaritata* Linn. (Light Emerald), which hibernate during the winter, are best sleeved on birch. When the leaves fall, they should be left in the sleeve to provide a retreat for the larvae

should they require it. Do not remove from the sleeve until the leaves are well out, because *margaritata*, like many other larvae, nibble the bark, and will usually die if deprived of their winter diet.

During the first week of September, search ash trunks and the grass stems nearby, for freshly-emerged *Atethmia centrago* Haw. (Centre-Barred Sallow). Late afternoon is the best time. Work light and sugar for this species after dark. *Tiliacea aurago* Schiff. (Barred Sallow) has its headquarters in the Chilterns, where it may be found in the beechwoods, by day, resting low down on the tree trunks, whilst at night it is attracted to 'sugar', ivy bloom, and light. This species does, of course, occur in other counties but is probably commoner in Bucks. The larva of *Cerura hermelina* Goeze. (Poplar Kitten) will be full fed on poplars and is best found by searching rather than beating.

R. V. Aldridge (262).

SCHOOL NATURAL HISTORY SOCIETIES

The latest publications of two school natural history societies have recently been received, namely *The New Biologian* (4th issue) from Lancaster Royal Grammar School, and the *Thirty-second Report of Gresham's School N.H.S.*, Holt, Norfolk..

Both are well produced little books, particularly the latter, which runs to 60 pages for 2/6, but unfortunately does not touch entomology in this particular number. Local meteorological records are reported, and there is a good ornithological section, but almost half the book is taken up with a prize-winning essay on Chlorophyll—its Structure, Function and Uses. This is an interesting, and well written paper although the reader needs a certain knowledge of chemistry to fully appreciate it. The book concludes with an ecological survey of the Dunwich neighbourhood (also a prize-winning essay), which is concerned with plants, birds and animals, but not insects. The report is well illustrated with photographs and line-drawings.

The New Biologian is a smaller book than the above. In addition to short articles on botany, meteorology, ornithology, ecology, animal behaviour, etc., our member, R. Underwood (2338*), who also edits the magazine, contributes an article on a foreign species of long-horned grasshopper found in a crate of bananas. The insect, not yet identified specifically, belongs to the sub-family Pseudophyllinae of the family Tettigoniidae.

This book is also adequately illustrated with photographs and figures.

BUTTERFLIES IN EAST ANGLIA: 1955

The writer recently visited some of the well-known entomological localities of Cambridgeshire, Huntingdonshire and Suffolk, and was surprised at the paucity of butterflies on the wing, despite brilliant weather.

Wicken Fen, on the morning of July 10th produced only four species, *Maniola jurtina* Linn. (Meadow Brown), *Aphantopus hyperantus* Linn. (Ringlet), and the two Whites *Pieris brassicae* Linn. and *P. rapae* Linn.; and no more than 20 of each species, during two hours of observation.

Warboys Wood was visited in the afternoon of the same day, where the same species were seen, plus two *Pararge aegeria* Linn. (Speckled Wood) and a few *Ochlodes venata* Br. & Grey (Large Skipper) in the best part of three hours.

Monks Wood, on the 13th, added one specimen of *Argynnis paphia* Linn. (Silverwashed Fritillary) to the list in four hours watching. *P. brassicae* was the commonest species here, about 30 in number, with *M. jurtina* 6 individuals, and *A. hyperantus*, 4.

The Breckland of Suffolk was the most productive in numbers, but even here, the only additional species to those already mentioned were *Eumenis semele* Linn. (Grayling), *Aglais urticae* Linn. (Small Tortoiseshell) and *Maniola tithonus* Linn. (Gatekeeper).

With such ideal weather the above results were very disappointing, especially in July at the height of the butterfly season.

B. R. Stallwood (1547).

REVIEW

A Manual of the Dragonflies of North America (Anisoptera), including the Greater Antilles and the Provinces of the Mexican Border. By James G. Needham and Minter J. Westfall, Jr. 8vo., xii, 615 pp., 1 col. pl., 341 figs. (California University Press), Berkeley and Los Angeles. 1955. Price $12.50.

This is a most important book for all Odonatists and the subject matter is, naturally, highly specialised. It

is, however, a book that will be of great value to all entomologists who are in any way interested in the presentation and illustration of entomological papers. The entire volume is a model of how to compress an enormous amount of information on identification into a restricted amount of space, without losing any of its attractive "layout". A novel, and very welcome feature, is a set of 22 Tables of quick identification, one for each section that the Keys are divided into, families and subfamilies, genera and species of both larvae (nymphs) and adults. These Tables help one quickly to eliminate all but the critical species, before one needs to turn to the more detailed Keys.

The feature of this book that will excite the greatest admiration, is the magnificent set of illustrations of the male genitalia, done by Dr. Westfall, the junior author, from enlarged photographs. He has used his special technique of clearing the material and gets the most perfect results, including the most amazing perspective. His photographs of a larva of each of the known genera have been made with the same methods and are equally successful. The reviewer considers that illustrations, when made with the above high standard of clarity, are beyond value, provided that typical specimens, to be used for the illustrations, are chosen with care and knowledge.

A standard work of identification and classification on the dragonflies of North America was badly needed to replace the old (1929) handbook by the senior author and Mrs. Butler Heywood. This time, the work is greatly enlarged and will appear in two volumes, the one under review being on the Dragonflies or *Anisoptera* (the Damselflies or *Zygoptera* to follow in vol. II). Even in one fat, stoutly bound volume of 615 pages, there is scarcely any room for notes on biology or ecology, but references are given under many species, where information of the kind can be sought. There has been a great advance in the descriptions of the larvae for each genus, but those of four genera are still unknown and the authors state that more knowledge of the aquatic stages is urgently needed. This is a formidable task with 332 New World species of the *Anisoptera* and about a third again for the *Zygoptera*, although the North Americans working on the Odonata number just about half those of the rest of the World.

Prof. Needham uses the venational nomenclature known as the "Comstock-Needham" and derived from the "pre-tracheation" theory, with one Radial, four Medial, two Cubital and 1-3 Anal veins. Many of us follow an opposite belief of "pre-determination" of the veins, which fits in with the physiologists' discoveries and also accounts for the veins not nourished by larval tracheae. This has the effect of making the venational nomenclature basically different, with 4-5 Radial, one Medial, one Cubital and the rest Anal veins. So long as these two opposing theories hold, every odonatist will have to learn the two systems of notation, but it seems more than unfortunate that a further complication has been created in this book. Generations of odonatists have called the three thoracic sutures in the dragonfly's uniquely formed Synthorax, by the descriptive terms of *humeral*, *1st lateral* and *2nd lateral sutures*. Now, on page 11, by text and lettered figure, the authors have renamed these sutures, *1st, 2nd* and *3rd laterals*, thereby creating chaos for all time, as from now on, no-one will ever know which is the correct lateral suture alluded to and these sutures play an important part in all descriptions of colour pattern. If better morphological terms were deemed advisable, then *mesopleural, interpleural* and *metapleural sutures* were the names that should have been used, but to have completely altered the positions of the 1st and 2nd laterals is disastrous and quite uncalled for.

The book is a very expensive one, but the review copy has been placed by the AES in the library of the Entomological Section of the London Natural History Society.

CYNTHIA LONGFIELD.

Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. 1955

The Amateur Entomologists' Society

ANNUAL EXHIBITION

1955

SATURDAY, 17th September, from 2 p.m. to 5.30 p.m. at **BUCKINGHAM GATE CENTRAL SCHOOLS,** Wilfred Street, London, S.W.1.

ADMISSION FREE.

EXHIBITS. The Hall will be open from 10 a.m. for receipt of Members' exhibits. Bring along your specimens (any Order, living or set), equipment, apparatus, photographs, drawings, etc. If you require a large space, notify Meetings Secretary in advance. Please label clearly.

TALKS. Entomological talks will be arranged.

DEMONSTRATIONS. Members will demonstrate setting of coleoptera, diptera and lepidoptera.

GROUPS. Members of Groups who have been corresponding will be able to meet for discussion.

SURPLUS TABLE. If Members have spare ova, larvae, imagines, equipment, books, etc., for sale or exchange, bring them along labelled with name, price, or exchange wants. No charge for use of this table.

ENTOMOLOGICAL TRADERS will be in attendance.

Offers of help and enquiries to Hon. Meetings Secretary (S. M. Hanson, 167 Gunnersbury Park, London, W.5).

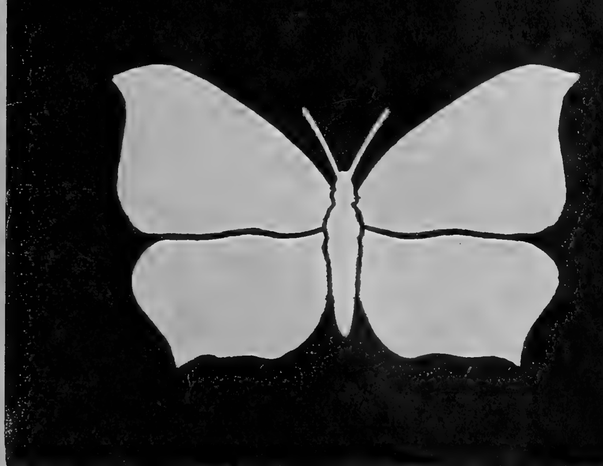
BRING YOUR FRIENDS AND AN EXHIBIT!

HOW TO GET THERE—

VOL. 14

No. 178

OBER - - 1955



THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

World List abbreviation : *Bull. amat. Ent. Soc.*

EDITED by B. R. STALLWOOD

AES

Members can help the Society in several ways:—

(a) By dealing with advertisers and mentioning the *Bulletin*.

(b) By bringing in new members. (Subscription, 12/- per annum. Juniors, 6/- per annum.)

(c) By buying AES publications and suggesting Public Libraries should buy them.

(d) By friendly co-operation with other members.

(e) By taking just that extra bit of trouble required to record happenings of note for the *Bulletin*.

AES NOTICE

WHERE TO WRITE

Membership applications, offers of help to: D. OLLEVANT, *3 Salcombe Drive Morden, Surrey.*

Advertisers to: L. W. SIGGS, *40 Repton Road, Orpington, Kent.*

Changes of address and non-arrival of Bulletins *to:* B. L. J. BYERLEY, [illegible] *Elmgrove Road, Harrow, Middlesex*

Offers to lead Field Meetings, exhibits etc., to: S. M. HANSON, *167 Gunnersbury Park, London, W.5.*

Manuscripts, drawings and books for review to: B. R. STALLWOOD, [illegible] *Southfield Gardens, Strawberry Hill Twickenham, Middx.*

Subscriptions (12/- per annum, [illegible] Juniors) to: K. H. BOBE, [illegible] *Road, London, S.E.12.*

Youth matters to: F. C. BROWN *6 Osmond Gardens, Wallington Surrey.*

AES BULLETIN

No. 178

OCTOBER 1955

LEPIDOPTERA FOUND IN GLEN LYON, PERTHSHIRE
4th to 16th July 1955

A fortnight's Field Meeting was planned, in the dismal days of last winter, to explore a little known glen in Perthshire. So far as is known, very little entomological studies have been carried out in Glen Lyon, the area a few miles to the north, around Loch Rannoch, having a far greater attraction as a well known and ancient locality. It was hoped that a study of Glen Lyon, coupled with colour photographs, would result in an interesting lecture for the Society's Annual General Meeting in March 1956.

Six members of the Society were included in the party, three of whom also took their wives. The members are, at the moment, engaged in collating the results and there is every reason to anticipate a successful outcome. The following notes are only the prologue, other orders were studied and further notes may be published in due course.

Glen Lyon is some 24 miles in length, flanked on either side by mountains, mainly over 3000 feet high. The first half of the Glen is fairly wooded with a considerable assortment of hardwoods, the other half to the head of the Glen at Loch Lyon being more or less devoid of trees. The River Lyon flows through fertile grassland in the woody half of the Glen but towards the head of the Glen the mountain flanks and mossy bogs preclude any cultivation and only occasional sheep farms are found. The mountain slopes are, in the main, grassy, of the bogland type and only occasionally heather clad. At the time we were there the bogs were dry, due to the long spell of fine weather, but presumably were normally much more difficult to negotiate.

Very few butterflies were noted in the bottom of the Glen, those that were recorded were mainly casual strays from higher up the mountains. Each of the common whites (*Pieris brassicae* Linn., *P. rapae* Linn. and *P. napi* Linn.) were recorded, but, except for *P. napi* (Green-veined White), only as odd ones. A small, very worn, colony of *Aricia agestis artaxerxes* F., the Scottish race of the Brown Argus, was found a few hundred feet up Carn Mairg which is on the north side of the Glen. This race has a white spot in the centre of each fore wing and no black pupils to the underside spots.

Erebia epiphron Knoch (Small Mountain Ringlet) occurred nearly everywhere on the mountain slopes. It was recorded in the bottom of the Glen at 600 feet but was normally found from about 1300 feet upwards. The behaviour of this species was different from that observed in the Cumberland localities in that it continued to fly during dull periods and was found to occur at much lower altitudes. The dull period flights may have been brought about by the high temperatures experienced during the period. It was in fairly good condition, better on the northern slopes than on the southern.

Coenonympha tullia Muell. (Large Heath) was widespread in the same habitats as *E. epiphron* but much less common. Only a few females were seen, and as the males were mostly perfect it is probable that this species

emerges rather later than *E. epiphron*.

Argynnis aglaja Linn. (Dark Green Fritillary) was just emerging in the second week and was fairly widespread over the lower slopes of the mountains towards the mouth of the Glen. No females were seen. *A. selene* (Small Pearl-bordered Fritillary) was taken in the woodland area but was becoming worn. Mainly females were seen.

Coenonympha pamphilus Linn. (Small Heath) was very uncommon and quite typical except for being rather larger than normal. *Polyommatus icarus* Rott. (Common Blue) was also uncommon but typical in form.

Among the moths recorded, the prize was *Psodos coracina* Esp. (Black Mountain Moth). This species was found on one mountain ridge only but fairly abundant. It occurred only on the ridge at about 3000 feet, east of Stuchd an Lochain, among a very prolific growth of Alpine Lady's Mantle. Although the plant grew much lower down, the moth was confined to the ridge, flying very low, about one or two inches from the ground, in the sunshine. South gives very little information on this species, none concerning the larval state* and according to reliable information the species is supposed to be commoner in even years. In other words the year 1955 should not be a prolific year.

Epirrhoë tristata Linn. (Small Argent and Sable) was fairly abundant, *Perizoma blandiata* Schiff. (Pretty Pinion) was uncommon and *Xanthorhoë munitata* Hueb. (Red Carpet) was just emerging, and all were recorded from most of the mountain sides visited. *Colostygia salicata* Hueb. (Striped Twin-spot Carpet) was found on rocks and among heather on the western slopes of Ben Lawers but nowhere else. *Entephria caesiata* Schiff. (Grey Mountain Carpet) began to emerge during our first week and was widespread but nowhere common. It was recorded from rocks by the River Lyon and also on rocks and among heather well up the mountains.

A colony of *Odezia atrata* Linn. (Chimney Sweeper) was found in a damp field beside the River Lyon. The colony was unusual in that it was extremely abundant in a comparatively small area although it was found elsewhere in the Glen in much smaller numbers. It would appear from other records that the abundance of this species in certain places is not unusual in Scotland.

No dusking for noctuids was tried in the Glen, but some work was done a few miles away, still in the Lyon valley. Probably due to the fact that the temperature dropped considerably each evening, coupled with clear skies and, at the beginning, a full moon, moths were scarce. A short list of the less common moths recorded includes: — *Graphiphora augur* Fabr. (Double Dart), *Amathes baja* Fabr. (Dotted Clay), *A. triangulum* Hufn. (Double Square-spot), *Eumichtis adusta* Esp. (Dark Brocade), *Apamea furva* Hübn. (Confused Brindle), *Cucullia umbratica* Linn. (Common Shark), *Plusia chrysitis* Linn. (Burnished Brass), *P. pulchrina* Haw. (Beautiful Golden Y), *Abrostola tripartita* Hufn. (Light Spectacle).

A m.v. lamp was also tried once. Numerous moths visited the lamp but they were preceded by literally thousands of small stoneflies, which took complete possession of the bulb and a circle round of 6 feet or more; consequently it was most difficult and exceedingly unpleasant to approach the lamp for the purpose of collecting moths. All the moths referred to previously as having been found by dusking, visited the lamp. One additional species not previously recorded was *Cleora lichenaria* Hufn. (Brussels Lace).

P. C. Le Masurier (978).

*Meyrick, E., 1928 *Brit. Lepidoptera*, p. 300, says "Larva probably on mosses". Scorer, A. G., 1913 *Entomologist's Log Book*, pp. 77, 203, gives the same.

●

ANOTHER INVESTIGATOR INVESTIGATED

The article "Investigators Investigated" (*Bull. amat. Ent. Soc.* **13**: 53) has called to mind two "Encounters with Authority" which occurred during my moth-hunting days in England long ago.

One evening—it was about 1906—I had gone to the sand-dunes near Palling on the Norfolk coast to search, after dark, for *Arenostola elymi* Treits. It turned into a wild, blustery night, and even sugared bunches of Lyme grass (*Elymus*) produced nothing. I sat down on one of the dunes for a quiet pipe, with my

acetylene lamp on the ground beside me. Almost at once I saw something white sitting on a grass-stem. It was a ♀ *elymi*. Throwing the lamp-beam around, I saw a few more. They were invisible from above; but a light from below showed them up clearly. So for a long time I went crawling about on all fours—or all threes, since one hand held the lamp—and was able to pick a good series from the hundreds that were there. Suddenly I was startled by a gruff voice which said, "What dew yew . . . " (but if I try to reproduce the Norfolk speech I shall get a derisive letter from one very well-known member of the AES, so I will change the dialect). What the voice said, then, was in effect, "Wot might you be a doing of? You can't do that there 'ere." I stood up, and found myself surrounded by a threatening ring of burly men, armed with hefty sticks. Two of them were coastguards, and the others apparently fishermen. They closed in on me, and listened with true Norfolk scepticism to my explanation: but after looking into my killing-bottle and boxes they began to believe and to be interested. Finally they unbent enough to explain that, with the dangerous Haisboro' sands not far off shore, no lights might be shown seawards from the dunes, and that I must clear out. Whether they had thought that I was engaged in the time-honoured sport of wrecking, or was merely smuggling, I do not know: but they were very much in the majority, and quite inexorable. So, having got plenty of *A. elymi* anyhow, I thought it best to "Go quietly".

On another occasion I was making for Norfolk on a motor bike, to try for *A. brevilinea* Fenn. The bike, as those of that remote period were wont to do, got slower and slower; until even with much 'l.p.a.' (the recognised term in contemporary motoring papers for "Light pedal assistance") I could get no further. I propped the nearly red-hot machine up, sat down by it in a ditch, and after a while came to the conclusion that the magneto timing had slipped. While I was fiddling about with this, the district Bobby came past, took a long look at me, and to my great relief passed on. "Relief"; because somewhere on the journey my back numberplate had dropped off, and I had made one of cardboard with letters and number in ink; and since in those days the Police were the sworn foes of motorists, they delighted to run them in on any excuse whatever. Well, I had got the machine nearly ready when Robert came back. This time he stopped, and said in an impressive tone, "Young man, YOU'VE GOT YOUR WRONG NUMBER". I began to stammer out that the plate had dropped off: that I had done my very best to comply with the Law: that *of course* I would get a new plate at the very next town; and . . . "Ho yuss", he said, "that's all right. But your plate says A.B." "Why, yes", I replied. "That stands for Worcestershire". "Ho, I don't know nuffin about that; but in *these* parts A.B. stands for 'Able-bodied'. YOU ain't able-bodied; you ain't moved out of that ditch for an hour and an 'arf." Hearty laughter, rather hysterical perhaps on my part, and we parted good friends. In the evening I met him in the "local", and the story, told and re-told as each new friend of his came in, cost me a number of drinks.

Perhaps I may be allowed to tell of another "encounter", though it was not with the minions of authority. There was, in those days, a long level road between Winchelsea and Rye, with hardly a house or tree to break its monotony. It was bounded by a deep ditch, in which Coltsfoot flourished exceedingly. One morning I was working *Platyptilia gonodactyla* Schiff. in this coltsfoot, and had also put up a number of *Nonagria geminipuncta* Haw. Standing up to stretch my back, I saw, on the otherwise deserted road, a solitary figure approaching me from the direction of Rye. When I looked again, the figure was much nearer, and I decided that it was probably a stranded motorist, because it seemed to be wearing a bulky fur coat, from ears to ankles, such as the opulent motorist of those days almost always wore. A little later I looked again: the figure was quite close now —much too close, in fact: for I saw it was a large brown bear, walking purposefully along on its hind legs, quite by itself. There was not a vehicle, not a person in sight anywhere on that long, lonely road: no help of any sort. What a horrible end for a promising young entomologist!

Well, the coltsfoot was thick and luxuriant; but it seemed a very

flimsy protection as I cowered down under it in the wet ditch. The bear, however, shuffled contemptuously on towards Winchelsea; and after a decent interval I burrowed along the ditch, got up on to the road, and made off for Rye. When I got near the town, I met two little panting Italians rushing along the road, one of them carrying a leather muzzle, and the other a length of chain. With nods and pointings I indicated Winchelsea, and they ran on. Presumably they caught their bear before it got to the town; for I never heard any more of it.

A. L. H. TOWNSEND (1691).

INSECT ORDERS

(*Continued from page* 74)

ORDER XIII

THYSANOPTERA (*Thrips*)

Thrips are minute insects, never longer than about 1 cm. The antennae are 6-9 jointed and the tarsi have 1 or 2 joints. There are no cerci. Mouth parts are of the piercing-sucking type. The wings (not always present) are very narrow, with venation reduced to a minimum, but bearing fringes of long marginal hairs.

Thrips live on plants, sucking the sap, or in rotting vegetation or fungi. They sometimes occur in such numbers as to become a serious pest. This is particularly true of species which normally live on agricultural crops; e.g., *Taeniothrips inconsequens* Uzel (The Pear Thrips), which can cause such damage to buds of pear trees that there is no fruit. Other thrips can be very damaging to certain greenhouse crops, also to cereals and to peas. The damage they do to these crops is due to their sucking the sap, which so debilitates the plant that growth is retarded, sterility may be produced, or the death of the growing tip occurs. Certain species in spite of their minute size are capable of sustained flight and in hot weather large scale migrations sometimes occur, millions of thrips taking part. At such times they may be seen swarming on walls both inside and outside buildings for several days.

Some species reproduce solely by parthenogenesis and the males are unknown. In other species, although the males may be common, the eggs are capable of parthenogenetic development. The larvae resemble the adults apart from the wings, the buds of which become more obvious with each instar. The last two instars are non-feeding stages, although in the penultimate it moves actively. They may be regarded as resting stages which approach the true pupa of the Endopterygota. The number of generations during a year is variable, some species having only one, others six or more. Hibernation may occur in any stage.

There are about 1500 known species of Thrips of which 183 species are known in the British Isles. The order is clearly subdivided into two sub-orders.

Sub-order I. TEREBRANTIA. Possess a saw-like ovipositor. In this sub-order the eggs are laid singly in slits cut in the foodplant by the ovipositor.

Sub-order II. TUBULIFERA. No ovipositor present in this sub-order. The eggs are laid, singly or in groups, on leaves, bark, etc., of the foodplant.

Whilst the life histories of the more important injurious thrips are fairly well known and there are numerous papers on them and their control, little is known about many of the species. The best work on thrips is a German work, *Die Thysanopteren Europas*, by Priesner, published in 1928; British species may be identified by reference to Dr. G. D. Morison's "Thysanoptera of the London Area", published in *The London Naturalist*, 1947-1949.

(*To be continued*)

BRIAN O. C. GARDINER (225).

OBSERVATIONS OF THE LARVAE OF *ROTHSCHILDIA JACOBEAE* WALK. (LEP. SATURNIIDAE)

In April 1953, I was given two newly-hatched larvae of *Rothschildia jacobeae*. I had never reared insects in captivity, and, indeed, knew very little about entomology at all. Fortunately the house I was living in was centrally heated, and there was a plentiful supply of privet in the garden, so my "charges" progressed well. I observed them carefully each day and was interested to note that they displayed distinct characteristics. One was darker in colour than the other, and less inclined to stray. It was also observed to eat the flowers of the privet

occasionally, but the lighter-coloured larva was never actually seen to do this.

Eventually both larvae span up, the darker one spinning a correspondingly darker cocoon.

In August 1953 a male emerged from the darker cocoon. The other pupa over-wintered. When it emerged the following summer (1954) it proved to be a female. It did not occur to me at the time that the difference in colour, etc., had any significance. Since then, however, I attended the Society's 1954 Exhibition, and saw there a display of set specimens of *R. jacobeae* and empty cocoons on which the exhibitor had noted the sex of the insects which had emerged, and I observed that in this case too the darker cocoons had produced males and the lighter ones, females. I realise that no reliable conclusion can be drawn from these limited observations, but the facts suggest that it might be interesting to study the colouration of larvae and pupae in relation to the sex of the resulting adult insects in other species.

B. W. Y. George (2238).

[The set specimens referred to in the above article were exhibited by myself. Although I had only noticed the difference in the colouration of the cocoons, our contributor goes one step farther. Members may be interested to refer to similar observations made by Mr. W. R. Smith (1641) in *Bull. amat. Ent. Soc.* **13**: 95.—Ed.]

HOW TO PHOTOGRAPH INSECTS

(The following material is taken from two articles in "The New Yorker", July, 1955, on the famous naturalist and microphotographer Doctor Roman Vishniac: it is hoped that the editor and author (Eugene Kinkead) will forgive us for passing on this small part of the biographical data to our members.—Editor.)

Dr. Vishniac scorns all photographs of dead or narcoticized creatures. When he decides to photograph some insect he begins by observing them for many hours. "The photographer", he says, "must not think like a man. He must think like a bug". When at length he feels sufficiently acquainted with an insect's habits, he sets off with his camera for a suitable haunt. Upon arriving there he lies down on the ground for an hour or more to saturate his clothing with the smells of the local vegetation, whiling away the time by rubbing his hands and face and equipment with grass and leaves. Then he commences stalking. Operating on the theory that insects are alarmed not by motion as such, for they see plenty of it whenever the grass and trees about them sway in the wind, but only by movements to which they are unaccustomed, such as man's jerky way of walking, Vishniac proceeds through field and forest with the rhythmical, swooping grace of a ballet dancer—swiftly or slowly, depending on whether there is a gale or only a breeze blowing. He is convinced that in this way he lulls insects into a sense of security that permits him to draw much closer to them than a plodding pedestrian could hope to get. In moving from woods to a field, or vice versa, Dr. Vishniac repeats the hour-long ritual of acquiring the smells of his new environment. He has discovered that a man who has been wandering in a forest is as conspicuous to the insects in a meadow as he would be if his suit had just been taken out of mothballs.

Once he has thus unobtrusively entered a community of insects, Dr. Vishniac waits for his subjects to come and pose. When one appears, he glides to within a foot or so of it, sinks slowly to his knees, and, steadying his camera (a single lens reflex with extension tube that facilitates focussing and magnifying at close range) by holding it tight across his chest, cautiously bends forward to gain a few more precious inches. Almost imperceptibly, he swivels the camera against his chest until he has the insect in his view-finder; in the final moments before taking a picture, he does not breathe (he has trained himself to hold his breath for two minutes). If he has to alter the camera's position by only a millimetre or two, he resorts to what he calls a fine adjustment, which consists of simply inhaling or exhaling a trifle; if a greater shift is necessary, he makes a coarse adjustment, bending his body backward or forward from the hips, still with a barely detectable motion.

Dr. Vishniac believes that next to fear, an insect's strongest emotion is curiosity and this seems to be borne

out whenever one spots his camera. The suddenly interested creature advances on the instrument, touches it with its antennae, and then peers through the extension tube like an inquisitive little boy trying to see what's inside. When this happens, Dr. Vishniac gives up attempting to get the insect in focus, for he knows that once its curiosity has been aroused, it will not be content to sit as a docile model again that day.

•

HUNTING-WASPS IN GERMANY

While doing my National Service in the Royal Air Force, I am stationed at Fassberg, on the Luneburger Heide. All around the camp are large pine woods and great areas of open heath, covered with heather. Just under the surface the ground is very sandy, ground, in fact, which suits the Hunting-Wasps.

The largest of these wasps is *Ammophila*. Many attractive, colourful descriptions have been tendered by such men as Fabre, who was one of the greatest "bughunters" of the past, all of which do this magnificent insect justice. Not even the greenest entomologist could fail to recognise this delicate insect, dressed in her black and yellow jacket, as she rushes hither and thither over the ground, seemingly not knowing where she is going, nor for what she is looking. Yet for all her beauty *Ammophila* is one of the most cold-blooded murderesses that Nature has ever devised.

I saw my first *Ammophila* as I was looking for larvae of the Large Elephant Hawk moth. She came buzzing round the plant I was searching, obviously looking for the same thing as I was. I followed her as she flew erratically over the ground and across the track on to a large expanse of heather. She suddently turned sharply and settled on a sprig of Purple Heather. Unerringly she pushed her way into the middle of the spray of flowers, and, sure enough, there in the middle was a large larva of the Emperor moth. I shooed *Ammophila* away and took the would-be victim for myself. I looked around for the wasp, but she had vanished, not without reason, I suppose. After this I forgot all about *Ammophila* to chase a Camberwell Beauty which I, unfortunately, failed to catch.

The following day I was sitting on a sandy bank, doing nothing in particular, when a frenzied buzzing at my feet took my interest. I cautiously moved my feet and saw a large female *Ammophila* digging a hole in the sand, or at least I assumed that she was digging. When a small pebble "accidentally" fell into the opening she gave it up as a bad job and flew away. It was not until I had seen the same thing happen three times, each with a separate insect, that I began to think that perhaps she was not digging after all, she may have been filling the hole in, after making her kill, *and be burying the victim.*

I scoured the area until I found another female seemingly digging a hole. She had only half done the job, when she stepped back, took a walk around it, then flew away. I promptly took out my penknife and gently dug up the burrow. Sure enough, about two and a half inches beneath the surface was a fat larva of one of the Prominents. I carefully removed the victim and placed it in a specimen tin. The precision with which *Ammophila* goes about her butchery was immediately obvious. The larva looked perfect, with no visible signs of injury, but quite dead, until a closer examination revealed the twitching of its skin.

This unfortunate caterpillar, for no other reason than that it was a caterpillar, was doomed to die a terrible death, by being eaten alive in *Ammophila's* underground torture chamber. The larva has since died.

I have not seen *Ammophila* make a "kill", but I have seen a smaller version of Hunting-Wasp (the identity of which I am not sure) at work. If anything, this little "lady" is even more delicately made than *Ammophila*. She looks like a dwarf form of the previous species, and, indeed, that is what she might be. Her colouring is exactly the same.

She seems to be very particular about her prey being green caterpillars. As she flew along she turned her nose up at the abundant black "loopers" in the heather, having time only for the green ones. She also seemed rather dim, lacking *Ammophila's* thoroughness.

She missed many likely victims, which even I could see from my standing position. Several times she settled on the heather beside small green caterpillars, waving her long,

slender antennae over them, seemingly sizing them up. Then she doubled the end of her abdomen underneath her. Like a flash she struck, driving her sting into the segment behind the victim's head. Immediately, nine times out of ten, the larva reared its head up and relaxed its hold on the heather, falling to the ground. The little butcheress did not have the sense to follow it down and finish its dirty work. Oh, no! She flew away looking for another victim.

Unlike *Ammophila* which, I believe, straddles her prey before stinging it, this Hunting-Wasp stood beside its victim, on each occasion, driving her sting into its side.

Since first starting to write this article I have been observing more of *Ammophila*. This morning I noticed, to my great joy, a female of the species struggling over the ground with a large "looper" caterpillar. She had great difficulty walking with her heavy burden, but she managed, by straddling it and dragging it with her mouth.

In the middle of a large area of sand she dropped her victim and started rushing around in circles, tapping the ground with her antennae. After a while she started scratching the sand away, in a part where there was no conspicuous mark which she could have used as a guide. She pulled a tiny lump of dirt out of the sand, exposing a neat, round hole. With a furious buzzing she went, head first, down the hole, to emerge a few seconds later with a few grains of sand. After dropping the sand, she went back to her victim, which was lying quite still except for an occasional twitch of its anal claspers. Seizing it by the head, she backed down the hole, dragging it after her. *Ammophila* promptly emerged and, after searching around for a few moments, picked up the same lump of dirt as before, and replaced it in the opening. She then brushed some loose sand over the dirt, completely covering her handiwork.

I waited until she had flown away before I dug up the burrow. When I did, I received quite a surprise, for there was already a grub in it eating a shrivelled-up caterpillar. It seemed to me that the *Ammophila* female which had just buried her victim there, was either replenishing the food for one of her earlier larva, or she was too lazy to dig a hole for herself and was using the hole of another female.

Can anyone explain the mystery to me? I always thought that *Ammophila* forgot all about her nests when she had stocked them up with food for her young.

Although I am a moth enthusiast, I am very interested in the Hunting-Wasps, and if any members would like any specimens sent to England I will do my best to oblige them.

R. BETCHLEY (2288).

OBSERVATIONS OF ELEPHANT HAWK LARVAE

On 20th August, 1955, I found by the river at Tonbridge, Kent, three almost fully-grown larvae of the Elephant Hawk-moth (*Deilephila elpenor* Linn.), two of them brown in colour, and the other green.

There is nothing specially remarkable in that perhaps, except that I had never before seen a fully-grown green one; but what particularly interested me was that they were feeding on the American Balsam (*Impatiens biflora*), a plant which in very recent years has established itself and become plentiful along long stretches of the River Medway.

They had completely wrecked the plant, which had collapsed on to the surface of the water, so that the two brown larvae were feeding within half an inch of the water. Their presence was given away by the green one, which was basking on the bare dry bank in full sunshine with a shade temperature of well over 80° F.

I brought them home and because *I. biflora* cannot be kept fresh when cut, I offered the larvae the choice of Great Willowherb and Rosebay Willowherb (it's sometimes very convenient to have a good selection of "weeds" in one's garden). They chose the Rosebay without any hesitation and did not even nibble the other. The green one span up the following day, and the brown ones two days later.

The question is: can the larva of *elpenor* swim?

L. S. BEAUFOY (628).

[P. B. M. Allan 1949 *Larval Foodplants*, gives both wild and cultivated species of *Impatiens* as foodplants of *elpenor*, but does not include Rosebay Willowherb (*Epilo-*

bium angustifolium). My own experience is that I have never found *elpenor* on any plant other than the latter.—Ed.]

LETTERS TO THE EDITOR

REARING GRAIN BEETLES—TO COMBAT MOULD

From D. W. Rorke (2168)

While reading through the chapter on Beetles of Stored Products in the *Coleopterist's Handbook*, I noticed that no mention was made of how to stop mould forming on whole grain in which grain insects are reared. May I suggest that in the case of mealies (maize) a small quantity of 'spergon' be mixed with the mealies so that they are slightly coated by this substance. 'Spergon' is yellowish in colour, and makes the mealies (white mealies) a pale yellow.

We use this substance in the Breeding room of the South African Bureau of Standards with excellent results in cultures of *Sitophilus* (*Calandra*) *granarius* Linn. This might be of use to other AES members.

COLOUR CHANGE IN PRIVET HAWK LARVAE

P. M. Sheppard (291) writes:—

D. J. Stradling, in a note, remarked on a change in the appearance of the larvae of the Privet Hawk Moth when kept in the dark. This change is almost certainly the result of the absence of light, and a similar change can be produced by keeping larvae under red glass. If this is done, not only is the horn black in the adult larva, but the purple marks on the side are much broader than normal, forming a purple patch, and spots of a black pigment appear on the ventral surface.

THE WORMWOOD SHARK MOTHS

P. J. Churchill (2221*) reports:—

While netting moths over buddleia in a period of three weeks (22nd July until the 12th August 1955), a friend and myself managed to obtain six specimens of what appeared to be *Cucullia artemisiae* Hufn. (Scarce Wormwood Shark). We have checked and re-checked 'South's' volumes trying to prove to ourselves that they were only *Cucullia absinthii* Linn. (Pale Wormwood Shark), but only one illustration seemed to coincide with our specimens, that of *C. artemisiae*. I would very much like to know if *C. absinthii* occurs in greyish forms; South's specimen is purplish.

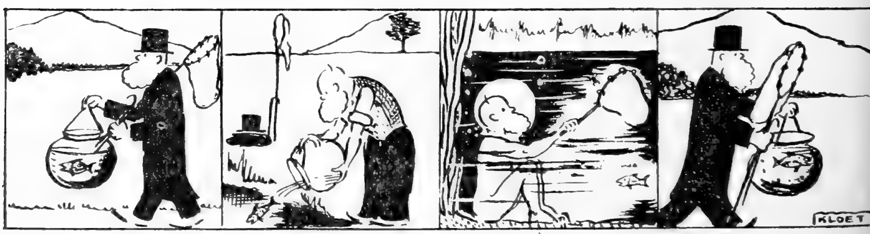
Even if they were *C. absinthii* they are unusual, I believe, in being caught in Surrey.

The Mugwort (*Artemisia vulgaris*) abounds where the moth is found, which is a rubbish tip overgrown with plants and trees of many species.

In the above mentioned period twelve specimens in all were seen. To find the larvae would of course settle the matter of identity immediately.

I should be very grateful if any member could help me to differentiate between the two moths.

Professor Fungus **By G. S. Kloet**



Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. 1955.

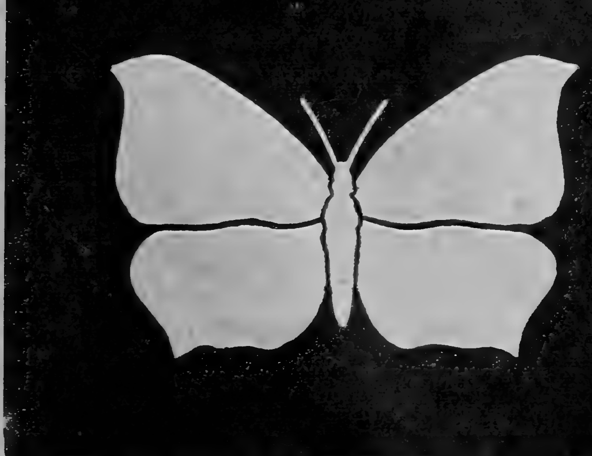
BRITISH NATURALISTS' ASSOCIATION (B.E.N.A.)

As one of the special fixtures arranged in 1955 to celebrate the 50th anniversary of the first appearance of "Country-side", an Exhibition of Natural History subjects including contributions from the Branches, will be held in the Lecture Hall, British Museum (Natural History), Cromwell Road, London, S.W.7, from 2 p.m. on Saturday, 22nd October. Among the films to be shown by Mr. H. J. Hurrell, will be one on the life of the Hornet. Visitors will be welcome and bookings for buffet tea (3s. 6d.) should be sent, with remittance, to 92 Rydes Hill Road, Guildford, Surrey, by 15th October.

VOL. 14

No. 179

EMBER - - 1955



THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

World List abbreviation : *Bull. amat. Ent. Soc.*

JUNIOR MEMBERS' NUMBER

EDITED by B. R. STALLWOOD

AES NOTICE

WHERE TO WRITE

Membership applications, offers of help to: D. OLLEVANT, *3 Salcombe Drive, Morden, Surrey.*

Advertisers to: L. W. SIGGS, *[illegible] Repton Road, Orpington, Kent*

Changes of address and non-arrival of Bulletins *to:* B. L. J. BYERLEY, *48 Elmgrove Road, Harrow, Middlesex.*

Offers to lead Field Meetings, exhibit, etc., to: S. M. HANSON, *157 Gunnersbury Park, London, W.5.*

Manuscripts, drawings and books for review to: B. R. STALLWOOD, *19 Southfield Gardens, Strawberry Hill, Twickenham, Middx.*

Subscriptions (12/- per annum, 6/- for Juniors), to: K. H. P[illegible] *Road, London, S.E.12.*

Youth matters to: F. C. BROWN, *6 Osmond Gardens, Wallington, Surrey.*

A E S
BULLETIN
No. 179
NOVEMBER 1955

CALLING ALL JUNIORS

First of all I want to thank, on behalf of the Council, those of you who have contributed to this *Bulletin*. Some of you will be seeing yourselves in print for the first time, and I hope that now you have "broken the ice" you will not be afraid to write to us again. Do remember that there is no need to wait for the next "Junior Number" before sending us a letter or an article; we welcome contributions from Junior Members in any issue.

As you know I only took over this job from Mr. Hanson at the last Annual General Meeting, and there are lots of you I still have to meet. I managed to see a number of you at the Exhibition, but others are still unknown, and I hope that we may get to know each other even if it is only through correspondence. Perhaps it would be a good idea to send me photographs of yourselves the first time you write, so that I may at least know what you look like!

However, do remember that the members of the Council are not a set of dull old fogies but a group of blokes who are all really keen to help every other Member of the Society whether he is 7 or 70! Let us know your problems, suggestions, experiences *and criticisms* so that we may feel that you are keenly interested in what goes on, and you in your turn may feel that you are getting more than value for your subscriptions. By the way, you won't forget to renew those subs. when they are due, will you?

After this *Bulletin* is published, I shall expect sacks full of letters from you—you may be sure I will answer them all in due course, and will look forward to helping you in any way I can. Get weaving now, and let's hear all about your "hunting" this year, the things you have made, interesting people you have met, funny things that have happened to you, and so on, and so on.

One last point. Not long ago I received a letter from a schoolmaster in Cambridge telling me that chaps at his school had been joining the Society and writing to other Junior Members whose names they chose from the list. They hoped to make new friends this way with whom they could exchange ideas and specimens, but they didn't get any replies! When I heard about it I managed to find a number of you who were willing to write back to them, and the idea is now beginning to work but they still want more chaps with whom they can exchange letters. If you would like to help in this way please let me know and I will pass on your names. You will answer all the letters written to you, won't you?

With all good wishes,

FREDERICK C. BROWN (2414),
Youth Secretary.

•

SOME INTERESTING OBSERVATIONS ON A FOREIGN LONG-HORNED GRASSHOPPER

Early in May this year, I heard from a friend that "a live locust" had been found in a crate of imported bananas and was asked if I would like to have it. Naturally I accepted this offer, since although a pest in the tropical countries, a live locust would be an interesting creature to study at home. When I saw the insect, however, I realised that it was not a locust but a long-horned grasshopper or bush-cricket.

The insect was a medium brown colour on the upper surface and a creamy-yellow beneath with dark brown spots. Although it was at least two and a half inches long (including the legs), it was only a young one since its wings were very small and undeveloped. Being a female, it had a short brown sword-like ovipositor protruding from the rear of its abdomen. The antennae were quite thin and delicate, and were waved about from side to side almost all the time, except when the insect was resting.

One morning, about half-past nine, I noticed that it looked browner and shrivelled up. My first impression was that it was dead, but closer investigation revealed that it had not died but was merely moulting.

Moulting is a process whereby grasshoppers and other insects shed their old hard skins, and while the new ones are still soft, expand. This allows the insect to increase in size despite the tough non-elastic nature of the skin. In this case the old skin had split along the dorsal side of the head and thorax, and when I first saw this moulting process, the thorax had just begun to force its way through. Very slowly and laboriously the thorax emerged, followed by the head, abdomen, legs and antennae. Every two or three minutes the emerging insect would swallow air and expand slightly, thus forcing the old skin further off. Then it would relax and take a rest. This process continued for about an hour till the head, thorax and abdomen were free, and then the legs and antennae were withdrawn by a series of short tugs. It was interesting to see that the grasshopper used its maxillary palps and mandibles to help the new antennae out of the old ones. The old skin left behind retained almost all the original features of the insect except for the abdomen, where the skin shrivelled up till it was very much reduced. After a while the whole skin contracted slightly and became much paler till it was almost white in parts. The insect that emerged showed certain striking differences from the original one. In the first place, there was a notable increase in the length of the wings, which were now about half an inch long. Secondly, there was an increase in the length of the body, though this was not quite so obvious; and, thirdly, the antennae, which had been of unequal length (owing to one having been damaged) were now as long as each other.

The majority of long-horned grasshoppers or bush-crickets (Family TETTIGONIIDAE) apparently prefer to live in the foliage of trees and shrubs rather than on the ground, and the insect described above may very well have lived on a banana tree. The greenish-brown colour would then blend excellently with the tree's leaves. In fact, to carry the resemblance further, many species possess wings shaped like leaves and this specimen is actually one which would do so when adult. They are usually partly carnivorous and partly vegetarian, though my specimen refused to eat anything whatsoever. Another interesting fact is that the males of the species, and occasionally the females, can produce sounds (stridulation) by rubbing together specially modified parts of their fore-wings. The crickets (GRYLLIDAE) stridulate in a similar manner, but the short-horned grasshoppers (ACRIDIDAE), if they stridulate, do so in a different manner, most commonly by rubbing their hind legs against their wings, as they do in virtually all the British species.

The insect has been identified from the cast skin as *Mastophyllum scabricolle* (Serville), belonging to the sub-family *Pseudophyllinae*, so called because many of them resemble leaves. It has hitherto been known only from Martinique, but it is now certain that specimens have come from Dominica, whence came mine. I have recently received a dead female adult grasshopper from the same place, and it is probably the same species. It is larger and very much darker, possessing elongated leaf-like fore-wings and large dark smoky hind-wings. The wing-span is about four inches. I understand that adults of the same species have been taken by Mr. W. Bunting at Thorne (Yorks.), April-May 1955. (Mr. D. K. McE. Kevan, *in litt.*).

In spite of attempts to feed the young grasshopper and keep it alive, it eventually died, and was pinned, set and preserved in the usual manner.

In conclusion I must thank Mr. D. K. McE. Kevan of the School of Agriculture, University of Nottingham, who helped with identification, corrected certain inaccuracies in the original script, and supplied some very interesting supplementary information.

R. UNDERWOOD (2338*).

ENTOMOLOGICAL PHOTOGRAPHY

Although single lens reflex cameras are probably the most suitable for insect photography, other types will be found quite satisfactory. I myself use a Dacora IA camera fitted with an f3.5 lens and taking 12 pictures $2\frac{1}{4}''$ square.

For miniature cameras with interchangeable lenses, extension tubes and near-focussing devices are obtainable, while owners of twin lens reflex and folding roll-film cameras can obtain supplementary lenses which allow focussing down to 10″. Plate cameras with double or more extension require no such devices.

Supplementary lenses costing about 5s. can be fitted in filter holders obtainable for about 8s.

The photographer must choose between either fine grain pan film (Kodak Plus X or Ilford FP3) and fast pan film (Kodak Super XX or Ilford HP3). However, the new Ilford HPS film, an extremely fast pan film (37° Sch.) if developed in Microphen will yield enlargements with no obtrusive grain.

As the depth of field at such short distances is small, the camera must be focussed with great accuracy. Failing some sort of ground glass focussing a small steel tape measure will suffice. In any case the smallest stop or aperture should be used, i.e., f22 and below.

Since most insects are lively subjects they should be temporarily etherised or subjected to a low temperature.

The photographer has several choices of artificial light at his disposal, each with certain advantages. Even daylight can be used.

Fuller and more expert information can be found in *Entomological Photography in Practice* by E. F. Linssen. Although rather expensive at 32s., it can probably be obtained from your local public library.

A. Huxtable (2156*).

BUTTERFLIES IN EAST ANGLIA, 1955

I was deeply interested in the article written by B. R. Stallwood (1547), entitled "Butterflies in East Anglia, 1955" (*Bull. amat. Ent. Soc.* **14**: 75). I visited Wicken Fen on the morning of May 31st, 1955, and observed the following species on the wing:—Five *Papilio machaon* Linn. (Swallow-Tail), which have recently been introduced into the Fen; three specimens of *Euchloë cardamines* Linn. (Orange-Tip), one *Callophrys rubi* Linn. (Green Hairstreak), ten *Gonepteryx rhamni* Linn. (Brimstone) and the following four species which were mentioned by Mr. Stallwood, i.e., *Maniola jurtina* Linn., *Aphantopus hyperantus* Linn., *Pieris brassicae* Linn. and *P. rapae* Linn., which all occurred in fairly large numbers.

On August 10th I observed one *Celastrina argiolus* Linn. (Holly Blue), many *Vanessa atalanta* Linn. (Red Admiral), *Aglais urticae* Linn. (Small Tortoiseshell) and *Nymphalis io* Linn. (Peacock), also at Wicken Fen.

At Monks Wood on the afternoon of July 16th I caught the following species:—One *Strymon w-album* Knoch (White-Letter Hairstreak), three *Argynnis paphia* Linn. (Silver-Washed Fritillary) and four *Agapetes galathea* Linn. (Marbled White). The two latter species were to be seen on the wing in large numbers.

I can only attribute Mr. Stallwood's disappointment in Monks Wood to the weather, as from the 12th to the 14th of July were some of the hottest days we had this year, too hot, even, for butterflies to be on the wing.

T. A. J. Woodford (2555*).

DIGGING FOR PUPAE OF *DILINA TILIAE* LINN. (LIME HAWKMOTH)

Some lepidopterists may say that digging for pupae is a sheer waste of time, others may be sceptical, whilst a few may say it is an unprofitable occupation. I will admit that the clerk of the weather can deter one, but so far I have only stopped at snow and ice, and here mother has taken a hand.

During the three years I have been digging, I have found that *D. tiliae* larvae prefer to be near water, and in my own home town I have confined my activities mainly to the river banks, where there are large numbers of lime and elm trees. To prove this, I visited a neighbouring town some distance away where there was a river, and in both places I had great success, my overall yield being some eighty pupae.

Cultivated places within a radius of three to four miles of water I have found to be most profitable, but in wild open spaces this work is often fruitless and frustrating. In most cases one needs a bulldozer to remove the bracken, ivy, and brambles, etc., growing at the foot of the trees.

Whilst digging, I observed that I found most pupae either lying under tufts of grass growing round the trunks of trees, or in the soft soil. The pupae are usually found one to three inches under the surface of the ground, and not more than two to three inches away from the trunks. In the majority of cases I found them almost flush against the bark. On an average I have obtained two pupae from each tree. Care must be exercised in digging as it is very easy to puncture a pupa.

The best time for digging is at the end of September, when most larvae will have pupated. Some will be found as larvae, and these can be placed in a tin or box without fear of being malformed. The most handy implement for digging is a small

trowel, which can be carried in the pocket. As a junior, may I hasten to say that using a large one tends to court trouble. Curious and furious old ladies seeing a large trowel in action have visions of seeing the tree uprooted, and the scenes which follow can well be left to the imagination.

In conclusion, may I wish every newcomer to pupa-digging as much success as I have had.

PATRICK COWLING (2547*).

ANT GYNANDROMORPHS

On the 13th July 1955 at Knock, Belfast, a queer ant of the species *Myrmica scabrinodis* Nylander hatched out in a formicarium of mine. It resembled a worker with tiny stumps of wings, and its gaster was missing. I separated it from the others but it died some hours later, having been accidentally damaged. On the 24th and after, a number of males and females hatched. The fourteen females (queens) were all abnormal, while twenty males were normal, but two had crumpled wings like most of the females. I do not know whether the poor development of the wings has anything to do with the abnormal condition of the ants. I have counted the number of articles on the funiculi of some queens. The number is eleven, and, therefore, normal. The size of the scapes varies, some ants having one larger than the other. The abnormality arises in the head and thorax. Here the brown of the female is mixed with asymmetrical black male tissue.

The colony, which was small at first, suffered when I left it on my holidays. Now there are about twenty workers and one queen.

I had the ants confirmed as *M. scabrinodis* gynandromorphs (probably var. *sabuleti*) by the British Museum. Derek W. Morley in *The Ant World* (chap. 8) says that only thirty-seven such ant monstrosities had been known up to 1945, when scores were found on Ireland's Eye. Also in *Ants* he says that it is of the utmost importance that anyone finding such mosaics should send them either to him, or to the British Museum (N.H.).

I was quite amazed when the B.M. was not interested and referred to them as "revolting".

IAN MCCLENAGHAN (2499*).

BOX HILL

In this article I should like to talk about butterflies and moths on Box Hill (Surrey). I think it is one of the best places on the North Downs for butterflies and, I think, for moths, too, but I have never had much luck with these. This year, on the "escarpment" which we call "Butterfly Hill", I've caught some good ones. This is what I've seen or caught:—

Clouded Yellow ♂ seen flying high (6-9 ft.) and fast along the top of the hill.

Large Skipper ♀ seen flying low (1-3 ft.) and fast down hill.

Silver-spotted Skipper—both sexes caught.

Painted Lady ♂ flying low (1-5 ft.) and fast up and down the hill.

Earlier on in the year, on Juniper Top:—

Silver-washed Fritillary ♂ seen flying fast up and down.

Marsh Fritillary ♀ caught.

Green-hairstreak ♂ caught.

Swallow-tail (sex not known) flying low (3-5 ft.) like a Meadow Brown.

I have only mentioned "rare-to-me" ones.

Now for the moths:—

There were some Goats about, also Scalloped Hazels. In the sunny glades I found Silver Y's, a variety of Yellow Underwings and Swallow-tailed Moths. Elsewhere there were Privet and Elephant Hawks and many varieties of Sticks, but there are lots of other species in the tree-tops or in the scrub that even birds cannot find!

GRAHAM MESSERRY-WHITING (2416*).
(Age 8½ years.)

AN UNUSUAL EXPERIENCE

One day in July 1955 I received a letter from L. Hugh Newman, the well-known butterfly farmer, asking for further help in collecting the 50,000 cinnabar moth pupae for a Government experiment. The minute I received the letter my mother, my five-year-old sister and I rushed out to "White Hill" to collect as many of these black and orange striped larvae as we could. After climbing the "Box Hill" we reached our selected place, and were depressed to find that there did not seem to be enough. After half an hour we came to the bigger part of the field and WIZZ—POP—BANG! here they were crawling

up every stalk of every plant. We picked them up in handfulls and popped them into paper bags. We worked so hard that we did not notice whether it was dull or sunshine. After what seemed like 2 minutes we came to the end of the field, and started collecting ragwort. At last we began walking down the hill, lugging our load. When we reached the bottom of the hill, I suddenly glanced at the large canvas in which Mummy carried the bags, and noticed a series of black and orange stripes crawling over the edge. "They're escaping", I screeched, and so we stopped to look, and found a small crack in a bag through which they were escaping in dozens! We decided to let them escape, and push them in when they ventured over the edge. When we reached our caravan on the top of Box-Hill, we were astonished to find that we had been five hours collecting and walking! After a quick tea we sorted them into six sleeves made of newspaper. The following day we counted the big ones into boxes with paper over the top and taped at the sides, and the rest into some bags; we were astonished to find that we had 1,200. The next day we found they were escaping, so taped it up as well as we could. This happened for several days. At last we had to go home to London for two days. We brought back from London some mosquito netting to replace the paper on the boxes. When we came back from London we opened the door and I could not believe it: they were all over the place! Up the curtains, down the walls, everywhere. After the tiring day, I had a night's sleep. One by one they began to pupate. After changing them at longer intervals, they had all pupated and I was free again. Oh, no! I was not! About two-and-a-half weeks later we found, under the sofa, one perfectly good pupa!

GRAHAM MESSERRY-WHITING (2416*).

A LEPIDOPTERIST IN SOMERSET

The following is an account of my collecting and observations from the 27th July to 6th August 1955 in and around the little village of Upton, Somerset. But for its inaccessibility, this locality would surely rival the New Forest as a lepidopterist's hunting-ground. The weather on all but the last day of my stay was warm and sunny.

I arrived at 6 o'clock on the 27th, and was much gratified by the sight of a Red Admiral (*Vanessa atalanta* Linn.) cruising around the yard. The only other butterfly life that greeted me, apart from a few Small White (*Pieris rapae* Linn.) was a solitary Hedge Brown (*Maniola tithonus* Linn.) basking in the last rays of sunshine. In the evening a single Drinker Moth (*Philudora potatoria* Linn.) ♂ came to light, together with Phoenix (*Lygris prunata* Linn.) ♂, Antler (*Cerapteryx* (= *Charaeas*) *graminis* Linn.) 2 ♂♂, Spectacle (*Abrostola tripartita* Hufn.) 4 ♂♂, and a few specimens of the Rivulet (*Perizoma affinitata* Stephens).

28th—In the hedges along the lane *M. tithonus* and *P. rapae* were abundant together with several Green-Veined White (*Pieris napi* Linn.) and a few Large White (*Pieris brassicae* Linn.). As I crossed the fields to the woodland I noted large numbers of Meadow Brown (*Maniola jurtina* Linn.) and several Ringlet (*Aphantopus hyperantus* Linn.) and at the entrance to my hunting ground—a steep, grassy hillside—I was greeted by several specimens of the handsome Marbled White (*Agapetes galathea* Linn.). This insect is abundant here; I saw only ♀♀ to-day, in the most perfect condition. On the lower slopes the Small Heath (*Coenonympha pamphilus* Linn.), the Small Skipper (*Thymelicus sylvestris* Poda) and a few Large Skipper (*Ochlodes venata* Br. & Grey) were flying in the morning sunshine. Here, too, the handsome Small Copper (*Lycaena phlaeas* Linn.) darted like a spark in the tall grasses. Down in the water-meadows by the stream, there were many more of this butterfly, together with *P. napi* and *A. hyperantus*. The splendid Dark-Green Fritillary (*Argynnis aglaia* Linn.) vied with the High Brown Fritillary (*Argynnis cydippe* Linn.) for possession of the thistle tops. The latter species is not confined to woodland in the south-west. Only ♂ *cydippe* were seen, while both sexes of the former species were abundant; the ♂♂ being somewhat worn. In the more wooded portions a few Purple Hairstreak (*Thecla quercus* Linn.) and Comma (*Polygonia c-album* Linn.) were seen. Here, too, there were large numbers of the Silver-Washed Fritillary (*Argynnis paphia* Linn.), only ♂♂, and in perfect condition. In addition there were a few Small Tortoiseshell (*Aglais urticae* Linn.) and the first Peacock (*Nymphalis io* Linn.) ♂♂

were on the wing. The Silver Y Moth (*Plusia gamma* Linn.) flew up from the grasses everywhere, and two specimens of the splendid Yellow Ringed Dragonfly (*Cordulegaster boltonii* Donovan) were seen. The beautiful and dainty *Agrion virgo* Linn. were everywhere along the streams, with a single *Aeschna cyanea* Muell. In the evening, at light, *P. potatoria*, 1 ♂, *A. tripartita*, only 1 ♂ to-night, and a few *P. affinitata*, were noted.

29th—*P. c-album* and *T. quercus* not seen to-day, but two Common Blue (*Polyommatus icarus* Rott.) were noted. *O. venata* also not seen, but *A. galathea* was even more abundant to-day, and a perfect ♂ taken. *A. aglaia* and *A. cydippe* are flying in large numbers although still only ♂♂ of the latter. A ♀ *aglaia* taken, which is unusually dark and has the fore-wings heavily smudged and powdered with black. *A. paphia*, flying in abundance and two ♀♀ taken. Some very fine *P. napi* ♀♀ taken to-day, with large spots and heavily smudged veins. Every day large numbers of *A. urticae* come indoors to "roost" on the ceiling. On the 27th I counted no fewer than thirteen. This evening two *C. graminis*, 1 ♂, 1 ♀, a few *P. affinitata* and two Burnished Brass (*Plusia chrysitis* Linn.) came to light.

30th—*P. icarus* was not seen to-day, but two fine *V. atalanta* were observed. On the moors the first Grayling (*Eumenis semele* Linn.), 1 ♂ and 1 ♀ were taken. *A. galathea* still common, and another perfect ♂ taken. All Fritillaries still abundant, and the first ♀ *A. cydippe* taken: very large and perfect. *P. gamma* still common everywhere, and the Chimney Sweeper (*Odezia atrata* Linn.) and the Small Purple Barred (*Phytometra viridaria* Ch.) were caught. This is rather a late date for the latter insect. In the evening a few *P. affinitata*, 1 *L. prunata* ♂, two Early Thorn (*Selenia bilunaria* Esp.) and a Marbled Beauty (*Cryphia perla* Schiff.) were taken at light.

31st—*V. atalanta* not seen to-day, but several *P. icarus* ♂♂ flying. Large numbers of freshly-emerged Painted Lady (*Vanessa cardui* Linn.) seen in a thistle field; probably the progeny of spring migrants. One Clouded Yellow (*Colias croceus* Fourcr.) ♂ seen to-day, flying very fast in a westerly direction. *E. semele* seen again, 3 ♂♂, 1 ♀. Fritillaries all abundant and another ♀ *A. paphia* taken. In the evening 1 *P. gamma* ♂; 1 *L. prunata* ♂ were taken at light together with a single male Striped Twin-Spot Carpet (*Colostygia* (=*calostygia*) *salicata* Hb.). This is mainly a northern insect and although it has occurred in Devon and Dorset, I know of no previous record for this county.

August 1st—A fine ♂ *C. croceus* taken at rest on a ragwort flower. *V. cardui* common, and *atalanta* seen again, together with 1 *T. quercus*. Fritillaries still abundant: 3 ♀ *A. paphia* taken. *A. galathea* still abundant: all ♀♀. *N. io* and *A. urticae* increasing in numbers. *E. semele* 1 ♂ and 2 ♀♀ seen to-day. *M. tithonus* ♀ taken: ab. *excessa* Tutt, very extreme. *L. phlaeas* var. *radiata* taken: the copper band on the hind-wings reduced to a few copper scales: barely visible. For the genetics of this rare variety see Ford, E. B., *Butterflies* (New Naturalist series). *A. virgo* abundant along the stream and many *C. annulatus* seen. In the evening the Small Phoenix (*Ecliptoptera silaceata* Schiff.) and the Common Wainscot (*Leucania pallens* Linn.) 2 ♂♂ were taken at light.

2nd—*V. atalanta* again seen, but *cardui* surprisingly absent. *A. galathea* still common: another good ♂ taken. Many Fritillaries about including several ♀ *paphia* (1 taken). The ♂♂ are becoming rather worn. 2 ♀♀ *cydippe* taken: one a very fine var. (see Fig. 1). The submarginal series of silver spots are pale yellow, and scarcely distinguishable from the ground colour: this is a modification of the form known as var. *cleodoxa* Esp. In addition the row of rust-red spots is replaced by a row of dark brown, almost black spots and the whole ground colour is of a deep olive-green, with the markings much darker and strikingly different from the normal specimens. On the fore-wings the silver marks at the apex, so conspicuous in the typical female, are completely absent. The var. is a very strange one and the insect bears a very strong resemblance to the continental *Argynnis niobe* Linn. which has been reported occasionally in the British Isles. I have a ♂ specimen taken here in 1953 in which the ground colour is a uniform pale yellow and the silver markings on the underside much reduced. Another fine male ab. taken to-day (see fig. 2). Two spots on the right hind-wing are joined to the marginal row of spots forming a large black patch. On the underside two silver spots in the sub-

Fig. 1. *Argynnis cydippe* ♀ var.

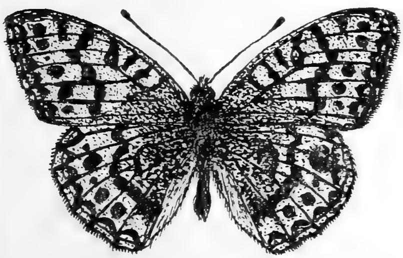


Fig. 2. *A. cydippe* ♂ var.

marginal row are joined. Only two *E. semele* seen to-day. In the evening *C. graminis*, 1 ♂, 1 *S. bilunaria* and 2 *C. perla* came to light.

3rd—Several *E. semele* seen to-day and 2 *C. croceus* flying very fast westwards. Two more *cydippe* vars. taken. 1 ♂ with the spots very large and numerous, and smudged with black on all four wings. The other a female is intermediate between the ♀ var. already described and the typical; having the dark spots and ground colour, but still retaining the normal silver markings. Many *P. icarus* taken including 1 ♀ *A. galathea* still abundant; all ♀♀, and getting rather worn. In the evening a few *L. pallens*, 1 *L. prunata* and several *P. gamma* taken at light.

4th—1 ♂ *C. croceus* taken flying westward and large numbers of *V. cardui* seen again, with a few *atalanta*. A perfect ♂ *A. aglaia* taken which is surprising, as most of the males are very worn now. Very few *A. galathea* to-day and hardly any *A. hyperantus* left in good condition. Many *A. paphia* still about; many of them ♀♀. A perfect *P. c-album* seen in the woodland. Very few moths in the evening. A few *L. pallens* and one ♂ Pale Shouldered Brocade (*Hadena thalassina* Hufn.) came to light.

5th—To-day was very dull and I did no collecting. A few *P. napi* and *A. urticae* were about, and in the evening a few "pugs" and 2 *P. gamma*. One of these is rather pinkish, almost of a rosy shade on the forewings.

6th—I left for London this morning and at 9.30 a.m. a few *M. tithonus* and *P. rapae* came to see me off.

The following notes are from a correspondent who is still staying at the same farm in Upton:—

8th—3 *P. icarus* ♂♂, 2 *A. aglaia* (*cydippe*?), and 1 *V. atalanta* on the moors in the morning.

21st—1 *C. croceus* flying west; captured at rest on a flower-head (species not stated).

25th—1 *C. croceus* seen flying north. *A. urticae* is coming indoors in large numbers; as many as 83 on the walls and ceiling to-day. *V. atalanta* is very abundant; 19 seen on one patch of Scabious.

P. E. Smart (2293*).

OBSERVATIONS

BUTTERFLIES IN ESSEX, 1955

The area I have studied is a wood with mainly deciduous trees. Through the middle is a cart-track which abounds with butterflies during the summer.

The first species to be seen in early spring were *Aglais urticae* Linn. (Small Tortoiseshell), *Nymphalis io* Linn. (Peacock) and *Polygonia c-album* Linn. (Comma). The Peacock and *Vanessa atalanta* Linn. (Red Admiral) were even more common in late summer than they were in the spring. The main attraction for the butterflies were the flowers of Teazel (*Dipsacus fullonum* Linn.) and Spear Plume Thistle (*Cirsium vulgare* (Savi) Ten.).

Only one specimen of *Vanessa cardui* Linn. (Painted Lady) was seen, but another member of this family found in August was *Argynnis paphia* Linn. (Silver Washed Fritillary).

Of the Satyridae, *Maniola jurtina* Linn. (Meadow Brown) and *Maniola tithonus* Linn. (Hedge Brown or Gatekeeper) were the first species to appear in the wood, but later *Aphantopus hyperanthus* Linn. (Ringlet) and *Pararge megera* Linn. (Wall Brown) were abundant, both darting up and down the cart-track.

The Lycaenidae were represented by *Lycaena phlaeas* Linn. (Small Copper), visiting Common Ragwort,

Celastrina argiolus Linn. (Holly Blue) and *Polyommatus icarus* Rott. (Common Blue) both the latter being regular visitors to the wood. Another visitor was *Strymon w-album* Knoch (White Letter Hairstreak) which is known as the "W Hairstreak" in our district.

Members of the Pieridae were *Pieris brassicae* Linn. (Large White), *Pieris rapae* Linn. (Small White), *Pieris napi* Linn. (Green-Veined White) and *Gonepteryx rhamni* Linn. (Brimstone), while from the Hesperiidae were *Ochlodes venata* Br. & Grey (Large Skipper) and *Thymelicus sylvestris* Poda (Small Skipper). I consider that this year was a much better year for butterflies than 1954.

R. Drane (2363*)

LEPIDOPTERA IN THE CARDIFF AREA, 1955

I would like to place on record the capture of a specimen of *Cryphia muralis* Forst. (Marbled Green) at Cardiff, Glam., during July at electric light. I believe this moth has never before been recorded from Wales.

Regarding butterflies, the Satyridae have been particularly common in the Cardiff district this summer, especially *Pararge aegeria* Linn. (Speckled Wood), *Pararge megera* Linn. (Wall Brown), and *Eumenis semele* Linn. (Grayling). I have also observed *Aphantopus hyperanthus* Linn. (Ringlet) in this area for the first time.

The gossip column of a local newspaper recorded the capture, recently, of three Chalkhill Blues (*Lysandra coridon* Poda) within Cardiff's boundary. Provided the specimens were correctly identified, they must prove to be a notable capture, for *coridon* does not naturally occur north of the Severn.

A. D. Lewis (2243*).

THE PALE CLOUDED YELLOW IN WILTSHIRE

On the 6th August 1955 I had the good fortune to catch a specimen of *Colias hyale* Linn. (Pale Clouded Yellow). This specimen was taken on the fringe of a golf course in West Wiltshire. The insect was in such perfect condition that I feel it must have been hatched near to where I found it. I would be very interested to know if any other members have observed a specimen of this species this year.

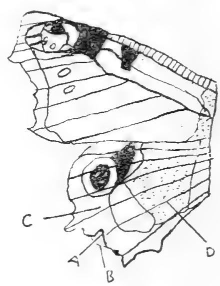
D. West (2105*).

A VARIETY OF *NYMPHALIS IO* LINN.

I hope that members will be interested to hear of a variety of the Peacock, which I bred on the 21st August 1955.

The upper wings were normal, except that the red was brighter than it usually is. The lower wings, however, were greyer than usual; "c" denotes the extensive piece of grey. There was also a large piece of speckled yellow which is shown by "d". This area is larger than normal. The most remarkable feature, however, about this butterfly was that there was a chip in the wing. At first I thought that I had spoilt the specimen, but after looking at it with its wings closed, I noticed that there was a chip on each of the lower wings, and that the chip was exactly the same shape, and in the same position on each wing. "a" marks the chip and "b" the usual shape of the wing. I should be very pleased to hear if any member has come across a similar variety.

M. Hull (2542*).



A CARRYING BOX FOR INSECTS

From J. Haslam (2519*).

Other readers may be interested to hear of my idea for a carrying box to hold specimens which have been killed in the field. It is very simply put together, and consists of a flat box (any size, according to needs) filled with two layers of cotton wool. The insects are placed between the layers of wool and are prevented from bumping around.

I thought of this idea when I had cycled for a long distance with some butterflies loose in a box in my saddle bag. When I reached home most of them were damaged beyond recognition, and the rest of them are now in my store boxes as rare, headless varieties with transparent wings (until I can get some more)!

Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. 1955.

PUBLICATIONS
of the
Amateur Entomologists' Society

"THE AMATEUR ENTOMOLOGIST"
Volumes in print are

Volume 5
Contains articles on "Some British Moths Reviewed" by W. H. T. Tams; "Habits of some British Moths" by Dr. E. A. Cockayne; "Setting Lepidoptera" and other papers.

Price 4s 6d

Volume 8
Contains illustrated articles on "Collecting Dragonflies," "Collecting Micros.", Sweepnets, "Collecting Mosquitoes," an eight-page list of standard books on Entomology, etc.

Price 5s (Members 3s 6d)

Volume 9
Practical Methods and Hints for Lepidopterists. Contains illustrated instructions for making many types of breeding and other cages; articles on breeding and collecting larvae; and illustrated instructions for making beating trays.

Price 5s (Members 3s 6d

Volume 10
Contains illustrated articles on "Collecting Lacewings," "Drawing Insects," "Collecting Caddises," "Photography of Caterpillars," etc. 12 photographic plates.

Price 6s (Members 4s 6d)

Volume 11
A Coleopterist's Handbook. Describes the tools and apparatus and methods of collecting British beetles; their habitats, commensals and pre-adult stages; how to record, photograph, make a personal collection and conduct a local survey. 20 plates.

Price 15s

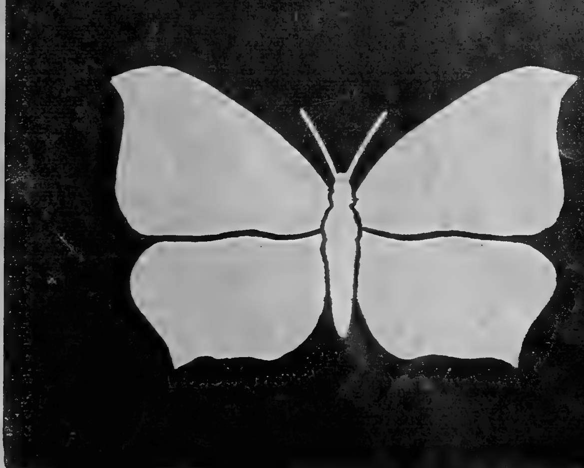
AES Bulletin

Volume 7, 1946-8.	232 pp., cover and index.	21s
Volume 8, 1949.	96 pp., cover and index.	10s 6d
Volume 9, 1950.	108 pp., cover and index.	10s 6d
Volume 10, 1951.	124 pp., cover and index.	10s 6d
Volume 11, 1952.	116 pp., cover and index.	12s 6d
Volume 12, 1953.	96 pp., cover and index.	12s 6d
Volume 13, 1954.	116 pp., cover and index.	12s 6d

VOL. 14

No. 180

CEMBER - - 1955



THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

World List abbreviation : *Bull. amat. Ent. Soc.*

EDITED by B. R. STALLWOOD

AES NOTICE

WHERE TO WRITE

Membership applications, offers of help to: D. OLLEVANT, *3 Salcombe Drive, Morden, Surrey.*

Advertisers to: L. W. SIGGS, *10 Repton Road, Orpington, Kent.*

Changes of address and non-arrival of Bulletins *to:* B. L. J. BYERLEY, *48 Elmgrove Road, Harrow, Middlesex*

Offers to lead Field Meetings, exhibit, etc., to: S. M. HANSON, *167 Gunnersbury Park, London, W.5.*

Manuscripts, drawings and books for review to: B. R. STALLWOOD, *16 Southfield Gardens, Strawberry Hill, Twickenham, Middx.*

Subscriptions (12/- per annum, 6/- for Juniors) to: K. H. BOBE, *49 Hengist Road, London, S.E.12*

Youth matters to: F. C. BROWN, *6 Osmond Gardens, Wallington, Surrey.*

AES BULLETIN

No. 180

DECEMBER 1955

COLLECTING EPHEMEROPTERA
(Mayflies or Dayflies)

A reference to the index of Vol. 13 (1954) of the AES *Bulletin* shows that in that year not a word was written about this fascinating order of insects, and the 1954 membership list shows a similar deplorable state of affairs—hardly any of our members state any interest in this group except perhaps as "fresh water" or some other term covering a multitude of other subjects besides.

I feel, therefore, that some effort, however small, should be made to arouse interest in these insects which are so neglected among amateur entomologists.

The Ephemoptera are represented in the British Isles by 48 species in 18 genera (taking into account the doubtful species). This small number, however, should not dismay the collector, as the nymphs have been found in many different types of freshwater habitat, ranging from static water tanks in London (*Cloëon dipterum* (L.)) to mountain streams (various species). Four of these species have also been added to the British list since 1939, so it is reasonable to expect that there are species waiting to be discovered by the entomologist, amateur or professional.

Characteristic features of the Ephemeroptera adults include the four wings (although in certain species the hindwings are minute or absent) with their important venation; the paired anal cerci and the median caudal filament, which is either well developed or almost absent; the genitalia, which are very primitive; the atrophied mouthparts and the subimaginal stage, a feature which is possessed only by the Ephemeroptera among all the insects. This is described below as part of the life history.

The early stages are passed entirely in fresh water, the eggs being laid in three different ways, the female either washing off a few eggs at a time (e.g., *Ephemera*, *Leptophlebia*, *Ecdyonurus*, etc.), depositing them all in one cluster (*Ephemerella*, *Centroptilum*), or crawling under water and attaching the eggs to suitable objects beneath the surface (*Baëtis*).

There are several types of nymph, many of them showing good adaptation to their surroundings. Needham has divided them into two groups, each with three sub-divisions.

This classification, with certain modifications as given by Harris (1952), is reproduced below.

1. Still or slow-flowing water forms.
   (a) Climbers among vegetation, agile streamlined forms. *Siphlonurus*, *Cloëon*, *Centroptilum*.
   (b) Crawlers upon the bottom, silt-dwellers. *Caenis*.
   (c) Burrowers in the bottom. *Ephemera*.
2. Rapid water forms.
   (d) Agile, free-ranging streamlined forms. *Baëtis*, *Paraleptophlebia*, *Centroptilum*.
   (e) Close-clinging limpet-like forms found under stones. *Ecdyonurus*, *Rhithrogena*, *Heptagenia*.
   (f) Stiff-legged, trash-, moss- and silt-inhabiting forms. *Ephemerella*.

Harris also states: "These ecological divisions are not exact, as considerable overlapping occurs among the different species".

Ephemeroptera nymphs may be distinguished from other orders having freshwater nymphs by their three "tails", and other characters. They feed mainly on filamentous algae, diatoms and fragments of higher plants; some species may be carnivorous.

After numerous moults, the subimago emerges. This stage, although being fully winged and capable of flight, differs from the fully mature adult in having dull and opaque wings, with a fringe of minute hairs (the imagines of *Caenis*, however, also have a fringe of hair on their wings), shorter legs, shorter anal filaments and median caudal filament (if present), and the male genitalia which are not fully developed. Transformation from the nymph occurs either underneath the water, on the surface or on some object at the water's edge. The subimago then flies away and shelters in vegetation

till, after a rest period, it moults to disclose the imago.

In many species, at certain times of day, the males and females gather to participate in their rising and falling mating flight, mating taking place in the air, the pair slowly losing height; copulation lasts only a short time and is usually completed before the ground is reached.

The egg-laying flight of the female may then commence immediately or she may again shelter on the shore; in both cases the male returns to the swarm. The actual egg-laying is described above.

Since Ephemeroptera adults have been widely imitated by fishermen in making fly dressings, it is not surprising that English names have been given to the Ephemeroptera, although in some cases groups of species have been given a single name because they are not readily distinguishable from one another by anglers, e.g., *Rhithrogena haarupi* Esb.-Pet., *Ecdyonurus venosus* (Fabr.), *E. torrentis* Kimmins and *E. dispar* (Curt.) imagines are all called the Great Red Spinner. In general the subimagines are known as duns and the imagines as spinners. Fishermen leave the order as a whole without a popular name, restricting the term "mayfly" to the genus *Ephemera*. Therefore, to avoid confusion, Kimmins (1954) has suggested. "That the term 'mayfly' be restricted to the genus *Ephemera*, and that as a comprehensive vernacular name for the order the term 'day-flies' be employed, thus falling into line with the German entomologists, who use the name 'Eintagsfliegen' ".

In collecting Ephemeroptera the usual type of butterfly net will serve well, although a fairly long handle is useful when dealing with high-flying swarms. Waterside vegetation, including trees and shrubs, should also be examined. Certain species, e.g., *Caenis* and *Potamanthus*, are mostly nocturnal and may be attracted to light, so light traps should not be neglected.

If subimagines are taken, they may be bred out to the imaginal stage by confining them in a box with rough sides to which the insects may cling. The atmosphere in the box should be kept humid by means of some pieces of dampened blotting paper placed in the box. If some subimagines can definitely be associated with the adults it is advisable to keep a few specimens for the collection as in many species the wing pattern is distinctive.

Ephemeroptera may be killed by any of the usual methods, e.g., cyanide, ammonia and crushed laurel leaves, although Kimmins (1954) states: "Specimens should not be allowed to remain in the killing bottle for more than a few hours, particularly when cyanide is used, or they may acquire a pinkish tinge which spoils them for the collection". It is advisable not to put many specimens in the killing bottle at once, and some loosely-crumpled tissue paper to prevent damage due to shaking about should be put in the bottle.

Alternatively specimens may be kept in fluid. They should be placed immediately in 70% alcohol for about an hour and then transferred to a solution consisting of one part of 40% formaldehyde (commercial formalin) in 19 parts of water. The alcohol treatment wets the specimens and allows the formaldehyde solution to penetrate the tissues of the insect; the specimens also sink into the formaldehyde solution, which they would not do without the alcohol treatment.

Nymphs can be put straight into the formaldehyde solution. All tubes containing fluid should be completely filled, as an air bubble moving in a tube can do much damage to the Ephemeroptera, which are very fragile insects.

Specimens in the winged stages may be set like Lepidoptera, or pinned through the side of the thorax, with the wings folded over the back or may be gummed to celluloid. The fore-legs and tails should be kept in place under the setting cloth: Kimmins (1954) states: "Strips of cellophane, as recommended by Mosely for Trichoptera, are excellent for this purpose." When setting subimagines to prevent crumpling and shrinking in drying, it is necessary to cover the entire wings and also the tails with the setting-strips.

The most up-to-date key to the adults available is the Freshwater Biological Association's Scientific Publication, No. 15, *A revised key to the adults of the British Species of Ephemeroptera*, by D. E. Kimmins, price 3/-. Besides giving an illustrated key to the adults this excellent publication also gives a most useful general introduction to the life history and structure of the order as well as giving notes on collecting and preserving, ecology of the species, and nomenclature together with a check list, and list of fishermen's names for them, with a note on them. However, a key to the nymphs is not given, as another

Scientific Publication giving a complete key to the species of the nymphs is in the course of preparation by Dr. T. T. Macan.

A key to the families and genera of the nymphs is given in the Royal Entomological Society's Handbook on the Ephemeroptera (Vol. 1, Part 9), also by D. E. Kimmins, but the keys to the adults in this work do not include a species (*Caenis robusta* Eaton) which was first found in the British Isles in 1951. However, this is included in the Freshwater Biological Association's key.

As all the species of Ephemeropteran nymph occurring in Britain have not yet been described. No key to all the British species exists but various papers, mainly by Macan, listed below, cover a good proportion of the species.

Several other references are also given which will be of use in the study of the order. These include the section in Mellanby's work on the Ephemeroptera nymphs which gives an account and illustrations; and Harris's "*An Angler's Entomology*", which gives a full account of the order together with a key to common species in the adult states based on easily observable characters, coloured photographs of many species and much information valuable to the angler. Other freshwater insect orders are also included.

Finally, it should be stated that much still remains to be learnt about the Ephemeroptera, the British list perhaps still being incomplete, as mentioned above, and it is hoped that this article will have aroused some interest in this fascinating but, as it seems, neglected order.

T. H. Pennington (2315*).

References.

Eaton, A. E. (1883-1888). A Revisional Monograph of recent Ephemeridae. *Trans. Linn. Soc. London (Ser. 2) Zool.* **3**.

——. (1888). A concise generical Synopsis, with an annotated list, of the species of British Ephemeridae. *Ent. Mon. Mag.*, **25** : 9-12, 29-33.

Harris, J. R. (1952). *An Angler's Entomology*. London.

Kimmins, D. E. (1950). *Handbooks for the Identification of British Insects*, **1** : Pt. 9. Ephemeroptera. Royal Entomological Society of London.

——. (1954). A Revised Key to the Adults of the British Species of Ephemeroptera. *Freshwater Biol. Assn. Sci. Pub. No. 15.*

——. and Frost, W. E. (1943). Observations on the Nymph and Adult of *Ephemerella notata* Eaton (Ephemeroptera). *Proc. R. ent. Soc. Lond.* (A) **18** : 43-49.

Macan, T. T. (1949a). The taxonomy of the nymphs of the British species of the genus *Ecdyonurus* (Ephem.), *Ent. Mon. Mag.*, **85** : 64-70.

——. (1949b). Descriptions of the Nymphs of the British species of Cloëon, Procloëon and Centroptilum (Ephem., Baëtidae). *Ent. Mon. Mag.*, **85** : 222-228.

——. (1950). Descriptions of some nymphs of the British species of the genus *Baëtis, Trans. Soc. Brit. Ent.* **10** : 143-166.

——. (1951). The taxonomy of the British species of Siphlonuridae (Ephem.) *Hydrobiol.* **3** : 84-92.

——. (1952). Taxonomy of the nymphs of the British species of Leptophlebiidae (Ephem.) **4**, 363-376.

——. (1955a). A Key to the Nymphs of the British Ephemeroptera. January 59-70.

——. (1955b). A Key to the Nymphs of the British Species of the Family Caenidae (Ephem.) *Ent. Gaz.* **6** : 127-142.

Mellanby, H. (1953). *Animal Life in Fresh Water* (5th edition). London.

Mosely, M. E. (1921). *The Dry-fly Fisherman's Entomology*. London.

Needham, J. G., Traver, J. R. and Hsu, Y.-C. (1935). *The Biology of Mayflies, with a systematic account of North American species.* Ithaca, New York.

THE ANNUAL EXHIBITION, 1955

A large throng of members, together with their wives, youngsters and friends, foregathered at Buckingham Gate Central School for our Annual Exhibition. I have been privileged to be present at these gatherings for many years now, and am convinced that the attraction of so enthusiastic an audience is due not only to the excellence of the exhibits, but also to the unequalled opportunity of meeting old friends, making new ones and of talking entomology to fellow enthusiasts. Further, as one of the foremost aims of our Society is to encourage the younger generation, here is a golden opportunity of chatting to, and answering the many queries of the large number of boys and girls whom we are so pleased to welcome every year.

A small disappointment was the decrease in the number of exhibits of Orders other than Lepidoptera, especially after the fine effort made last year. It is realised that a good proportion of our members specialize in Lepidoptera, but it is felt that

many of those interested in other Orders are reluctant to bring an exhibit, on the ground that it may be a common species, or not showy enough. Nothing could be further from the truth, as these Orders provide a great deal of interest and add greatly to the appeal and prestige of our Annual Exhibition.

Unfortunately it was only possible to record a proportion of the exhibits, but a note of these may be of interest. Among those of Orders other than Lepidoptera, we were very pleased to welcome once again the fine display brought by the Curator of Insects from the London Zoo. He showed exotic species of grasshoppers, desert locusts, praying mantids, millipedes, spiders, scorpions, and hermit crabs. These were housed in clear plastic containers, which are such a boon for this purpose. The very go-ahead Microscopy Group gave, with the aid of high-powered microscopes, drawings and specimens, a detailed survey of the development of the four stages of the Argentine form of the Praying Mantis. Mr. K. C. Side (2140), whose study of the insects living on the Wayfaring Tree has been appearing in the *Bulletin* this year and which has now been published as a separate *Pamphlet*, filled a large table with striking and most informative illustrations of his work. Mr. B. L. J. Byerley (788) had gathered together a representative collection of Tabanidae (Horse Flies). A striking feature of these insects, when living, is the pronounced green and purple eyes, and it is hoped shortly to obtain photographs of these in colour. Mr. N. B. Baker (2264) presented drawings and specimens of Coleoptera; Messrs Smith and Nicholson further illustrations of the variation in Mantid egg-masses; and Mr. P. Taylor (719) a collection of interesting insects including the beetle *Prionus coriarius* Linn.

The display of Lepidoptera was extensive, and covered many features; it paid a tribute to the zeal of the members, and to the excellence of the 1955 summer. Notably, the Microlepidoptera Group showed a welcome increase in interest. Mr. D. Ollevant (1514) exhibited Pyralidae taken this year, and suggested that these families offer a fruitful field for the collector, especially as an adequate text-book for identification is now available. Mr. R. W. J. Uffen (1660) included a fully-illustrated life history of the leaf-miner, *Gracillaria syringella* Fab., among the species of Microlepidoptera shown; and Mr. M. E. Castle (2490) gave detailed instructions for the construction of setting boards for the 'micros'.

Quite a number of members specialized in variation. Mr R. V. Aldridge (262), Mr. R. J. Gent (192) and Mr. P. E. Smart (2293) provided many examples in butterflies and moths; Mr L. W. Siggs (243) species liable to melanism; Mrs. J. O. I. Spoczynska (751) colour variation in the genus *Triphaena* (Yellow Underwing Moths); Mr P. D. Piper and Mr. W. H. James (120) variation in the Wall Butterfly (*Dira megera* Linn.) and Poplar Hawkmoth (*Laothoë populi* Linn.) respectively, whilst Mr. W. J. Akester (2423) had contrived to photograph an unusual pairing between the Poplar and Lime (*Mimas tiliae* Linn.) hawk-moths.

Collections of British Lepidoptera were provided by Mr. S. M. Hanson (320) with interesting series of butterflies; Mrs. J. O. I. Spoczynska (751) with many local species; Mr. C. A. McDermott (2488) including a British specimen of the Eastern Tortoiseshell (*Nymphalis xanthomelas* Esp.), a species closely resembling the Large Tortoiseshell (*N. polychloros* Linn.); Mr. P. E. Smart (2293) rare migrant butterflies, some of great antiquity and including a *Papilio podalirius* Linn. (Scarce Swallowtail) with a data label marked 1826; Mr P. W. Crabb (2270), specimens taken in Sussex during 1955; and Mr. F. C. Brown (2414), moths bred from the London bomb sites. The latter comprised an astonishing range of species some of which were probably already resident in nearby parks and gardens, but a good proportion were thought to be new arrivals.

Other interesting aspects of British Lepidoptera were covered by Mr. R. V. Aldridge (262) with a County list for Buckingham; and Mr. I. D. Loe (2525) hand paintings of Vanessids. As in past years, Mr. P. C. Le Masurier (978) illustrated his exhibit with enlarged photographs and specimens. This year the subject was the Field Meeting undertaken by six AES members and wives to Glen Lyon, in Perthshire, from 4th to 16th July. A fuller report of this Meeting appears in *Bull. amat. Ent. Soc.*, **14**: 77, and it is proposed to show the

whole expedition with colour slides at the 1956 Annual General Meeting of the Society. A large number of members exhibited larvae, and though space does not permit of a detailed survey, the Council would like to stress how welcome are these living exhibits: it is felt that most active field workers could easily produce a few types for show at our Exhibition.

Of considerable interest, too, were the exotic lepidoptera. A junior member, Mr. A. Saunders (2419), filled a large table with 8 cases of American and Bermudan Butterflies, many bred by himself; Mr. N. Wilding (2528) illustrated with examples of all stages the life cycle of the Moon Moth *(Actias selene* Hübn.); an unknown member, Indian butterflies and moths; Mr. W. J. Perrie (2472) species from many parts of the world; Mr. R. Hutchins (2412) specialized in Silk Moths; Mr. R. Woodward (2247) a large representative collection of European butterflies; and Mr. Trevor Trought (1480), whom we are most pleased to welcome back to this country, many species from Jordan, including specimens of one new to science.

We were honoured to have as our lecturer this year our member, Major Maxwell Knight, O.B.E. (956). With his well-known style of address, he gave a most interesting lecture entitled 'Insect Study as a Necessity'. He pointed out how studies of nearly all branches of Natural History involved in some way or another a knowledge of insects. He mentioned his keen interest in Bird Pellets in which a knowledge of insects is essential, and referred to the reduction in recent years in the number of frogs, which he attributed to the increased use of insecticides and the consequent disappearance of their food supply. A large audience showed their appreciation in no uncertain fashion.

As usual, leading natural history dealers were in attendance, and their displays were keenly inspected by a steady stream of customers. A table was provided on which members were able to place specimens, books and apparatus for exchange or sale, and an AES Stand showed the full range of our publications. Mr. E. Lewis (952), with monumental patience, had prepared name labels for every member of the Society. These were arranged alphabetically on a large stand, ready to be pinned to members on their arrival. A promising number of new members were enrolled and information given to prospective members. It was appreciated that tea facilities were once again available. Before closing, I would like, on behalf of the Council, to thank warmly all those members and friends whose interest and hard work made this Exhibition possible: also to congratulate our organiser, Mr. S. M. Hanson (320), whose hard work ensured its smooth running and success.

R. D. Hilliard (99).

COLEOPTERA IN PERTHSHIRE
(4th-16th July 1955)

Mr. P. C. Le Masurier (978) has already given a description of Glen Lyon in his account of the Lepidoptera found there—see *Bull. amat. Ent. Soc.* **14**: 77.

Coleoptera were not studied intensively, but specimens were taken when seen, if they had not previously been recorded. The majority of specimens were taken at the bottom of the Glen beneath Carn Mairg, the altitude of the river at this point being about 550 feet above sea-level. The Carabidae were well represented by *Carabus violaceus* L., *C. catenulatus* Scop., *Pterostichus madidus* F., *Pseudophonus pubescens* Mel., *Abax ater* Vill., *Cychrus rostratus* L., *Notiophilus biguttatus* F., *Trechus quadristriatus* Schr. In the Elateridae: *Corymbites cupreus* F. was taken; according to Joy, this species is very local. *Melanotus rufipes* Hbst. and *Athous hirtus* Hbst. were also recorded. Also found in this area were:—Chrysomelidae: *Chrysolina staphylea* L., *Luperus longicornis* F., *Plateumaris sericea* L.; Curculionidae: *Phyllobius glaucus* Scop.; Lucanidae: *Sinodendron cylindricum* L.; Cantharidae: *Rhagonycha lignosa* Müll.: Melandryidae: *Melandrya caraboides* L.; Dascillidae: *Dascillus cervinus* L.

Scarabaeidae: *Geotrupes stercorosus* Scriba was found throughout the Glen and up to about 2,000 ft. By the side of Lochan na Cat at 2,300 ft. the large Carabid *Calathus melanocephalus* L. was found under moss covering rocks. From a small pool on Creag Dhubh the Dytiscid *Agabus bipustulatus* L. was taken.

On the one night that a M.V. lamp was operated, amid the crowds of stoneflies, five specimens of the

Scarabaeid *Aphodius rufipes* L. were the only beetles that put in an appearance.

Two beetles, worthy of note, were taken outside Glen Lyon. At Loch Tummel the very attractive Scarabaeid *Trichius fasciatus* L. was observed flying from blossom to blossom of Marsh Thistle. This beetle looks like a bee not only when feeding on a flower, but also when it is in flight. The second, *Cetonia cuprea* F., the northern form of the Rose Chafer, was taken at Blackwood, Rannoch.

I am indebted to Mr. E. Lewis (952) for helping with the identification of the specimens.

B. L. J. Byerley (788).

A FIELD COURSE IN ENTOMOLOGY

At the end of July 1955 I attended a field course in Entomology for beginners at the Juniper Hall field centre near Box Hill, Surrey. As the title suggests, it was a practical course, carried out primarily in the open countryside. The students included a research botanist and two Dutch boys and we were all interested and keen to learn about the insect world.

After a preliminary lecture on the subject, we set out for the "Happy Valley" on Box Hill. Here, under the expert guidance of Mr. John Sankey, we began the week's work. We were set to catch two or three species of insect from each order possible. Members of fourteen orders were found. The various ways of life were explained and we were shown how to catch various ecological types of insect. The four main aims of the course were the ecology, methods of collecting, of identifying and of preserving insects. Demonstrations of setting and preserving all types of insect were given by Mr. Sankey during the evenings.

Notable insects on Box Hill were *Hesperia comma* Linn. and *Limenitis camilla* Linn.

Different ecological situations were studied each day. A peat-bog near Thursley proved very interesting. A large variety of Odonata were collected for identification. Pine-trunks in the area were searched for *Hyloicus pinastri* Linn. but none was found.

Frensham Common was another interesting place. A sandy heath, it is a happy hunting ground for the entomologist. Among our captives were *Asilus crabroniformis* Linn. Britain's largest fly; the Pine Sawfly (*Diprion pini* Linn.); Eyed Ladybird (*Anatis ocellata* Linn.) and a number of *Plebejus argus* Linn. Sand-wasps and *Chrysops* flies were also noted, the latter usually by a sharp prick on some exposed part of the body.

A mercury-vapour lamp was used to study the night-flying insects. A few specimens were taken with the net for identification. Large numbers of moths were attracted by this powerful light, among them being *Hepialus humuli* Linn., a rare visitor to light, and two *Deilephila elpenor* Linn. A very good beetle, *Oncomera femorata* Fab., was taken on the window of Juniper Hall.

Although the humidity was high, "sugaring" of larch trees produced or attracted far more entomologists than insects—1 Carabid beetle being the only captive.

Woodland ecology was studied but owing to the very dry conditions the catch was not very great. Scavenging insects were searched for in dead bodies of birds and dung heaps.

At the end of the course a general discussion and a small competition proved very enjoyable.

To anyone interested in gaining practical experience in Natural History I would strongly recommend a C.P.F.S. course. Thorough individual coaching and advice is given, and makes the course instructive and enjoyable. I hope many others will share my experiences.

J. M. Chinery (2466*).

CALLING ALL JUNIOR MEMBERS

The Youth Secretary writes:—

First of all I want to draw your attention to one of our meetings, which no Junior Member living near London will want to miss. You will have seen from your "Wants and Exchanges List" for October that on Saturday, 10th December, we are holding a "Beginners' Night" at the Caxton Hall (Room 17) when we hope to be able to arrange a setting demonstration, together with a discussion on collecting methods, equipment, and on London habitats. I do hope you will make every effort to come along to this meeting as it is certain to be useful to all of us. There are very few of us, for instance, who cannot profit by a demonstration of the correct methods of setting! Caxton Hall is within five minutes walk of Victoria Station and can easily

be found by anyone who has a tongue in his head! The meeting will start at 6 p.m., and will be over by about 8.30 or so. All A.E.S. members and their friends will be welcome.

My second point this month is once again concerned with payment of subscriptions. Every month Mr. Ollevant sends me a list of new Junior Members, so that I can add their particulars to my records, and I have been congratulating myself that our membership was steadily increasing, as I was hoping to double it during my first year of office. You can imagine my horror, therefore, when, with the October list, he also sent me a list of about thirty Juniors who had not paid their subscriptions for 1955, and were consequently not receiving their Bulletins any longer. This list was equal to about three months' intake of Junior Members so that we are roughly back where we were last July, in membership.

I am trying to contact all these "non-payers" so that I may find out their reason for not wishing to continue their membership, and it is proving no easy task. I do ask you all, therefore, to renew your subscription promptly at the beginning of the year, or to let me know if there is any reason why you do not wish to do so. You see, there may be some reason for your dropping out that is shared by other members, but if I do not know what it is, I cannot do anything about putting things right for you. It is the hope of all of us on the Council that every Junior will one day become a full member of the Society, although we realise that this changeover may often come at a time when many of you are being called up for National Service. Do try and carry on, however, even when this happens to you—there are plenty of entomologists in the Forces—and even if you cannot manage the subscription for a couple of years, keep in touch with us and get back into the swing of things as quickly as possible after your "demob".

Finally, don't forget what I wrote in the November *Bulletin* about getting in touch with me if you feel I can help you at any time. It was a great thrill meeting so many of you at the Annual Exhibition, but there are plenty more who have never written to me or met me, and I want you to know that I am out to serve you ALL, and not only the privileged few who may live near me or who frequently write to me, or talk to me on the telephone. As I look out at the fog swirling round my study windows I am reminded that it is more or less the "close season" for entomologists, especially for those of us who concentrate chiefly on butterflies, but even in the winter months there is plenty to be done and I hope to have the opportunity of meeting or hearing from many more of you before we become really active once again.

Good luck, a happy Christmas, and here's to next year's "hunting".

FREDERICK C. BROWN.

SOME PRACTICAL SUGGESTIONS FOR COLLECTING BOXES, etc.

P. G. THORPE (2398*) writes:—I have recently thought of two ideas that might be of some use to other members of the Society—collecting boxes and ammonia (NH3) for killing bottles.

My collecting boxes are ordinary chocolate boxes with cellophane lids. The boxes must have raised lids, e.g., Cadbury's "Milk Tray" chocolate boxes. The top of the lid is cut out and replaced by cellophane fixed in position with "sellotape."

The NH3 for killing bottles is not very good. It comes from broken bicycle-lamp batteries. I have recently had my battery broken, and so I took it to bits. Having dealt with dry batteries in science at school, I instantly remembered the ammonia smell of live batteries. The inside of the batteries came out of the zinc casing easily, and the sal ammonia paste also came off easily. I put the black powder into a 1-lb. jam-jar with a zinc (perforated) cover on top.

Results:—I put four different species of moths in the jar—Brimstone Moth (*Opisthograptis luteolata* Linn.), Small Magpie (*Eurrhypara hortulata* Linn.), another unknown micro, and another unknown macro. The macro-lepidoptera were killed instantly, but I have not seen any effect on the micros.

I hope these items will be of some help to other members.

OBSERVATIONS OF ELEPHANT HAWK LARVAE

I have read with interest the note by Mr. L. S. Beaufoy (628) (*Bull. amat. Ent. Soc.* **14**: 83) on the finding of larvae of the Elephant Hawkmoth (*Deilephila elpenor* Linn.) on American Balsam on the Medway at Tonbridge.

In the early years of this century the larvae of *D. elpenor* were to be found on the American Balsam on the banks of the Wey Navigation Canal at Newhaw, near Addlestone, Surrey, and around a pond in that vicinity. Some of the full-grown larvae found there were certainly green. I have never been in that neighbourhood since before the first war and know nothing of the present conditions there.

In the last ten years or so a good many full-fed larvae of *D. elpenor* have been sent or brought to me. All have been brown.

I was inclined to regard Mr. Allan's omission of Rosebay Willowherb from his list of foodplants of *D. elpenor* as a technical slip till I consulted several other books (South, latest edition, Stokoe, Scorer, Newman and Leeds) and found that none of them mentioned it.

F. H. Lyon (1026).

LARVAL FOODPLANTS

There is an editorial note (*Bull. amat. Ent. Soc.* **14**: 83) which seems to me to suggest a misunderstanding about the scope and object of my handbook *Larval Foodplants*. The first sentence of the Preface of my book (page 5) makes its plain that the primary object of the book is to indicate various foodplants upon which the inexperienced field lepidopterist can rear the British butterflies and most of the larger moths from egg to pupa. The first sentence of the second paragraph says that "only a fraction of the plants upon which many species feed is here given". Surely (with respect to the Editor's note) if *Deilephila elpenor* feeds on *Epilobium hirsutum* and *E. palustre* as well as on the various plants of disparate Families which are also given, it is a hundred pounds to a penny that it will feed not only on *E. angustifolium* but on *E. montanum*, *E. parviflorum* (on all three of which plants I myself have found *D. elpenor*) and the other ten species of *Epilobium* given in Clapham's *Check List*. Not every lepidopterist is an experienced botanist, and perhaps only a few could identify with certainty the fifteen species of *Epilobium* (I include *angustifolium*, now placed under *Chamaenerion*, and the occasional *adenocaulon*) known to occur in our island. So polyphagous an insect as *D. elpenor* may well have been found on all these plants.

I do not think any useful purpose would be served by anybody undertaking the Herculean (and indeed Sisyphean) task of compiling lists of *all* the plants upon which each species of the British Lepidoptera has been found. Such a lexicon would need to be copiously interleaved for the additions constantly being made by purchasers of it.

May I also call the attention of those who use *Larval Foodplants* to the third paragraph of the Preface?

P. B. M. Allan.

ADDENDUM TO LEPIDOPTERA FOUND IN GLEN LYON, PERTHSHIRE

Since the original article appeared (*Bull. amat. Ent. Soc.* **14**: 77), Comdr. G. W. Harper has kindly corrected my observations on *Psodos coracina* Esp. (Black Mountain Moth). From his own extensive experience in Inverness-shire he states that this moth is commonest in the odd numbered years. He states that this year it was in profusion on nearly all the local mountain tops from the middle of June to the end of July. This moth normally passes two years as a larva but Dr. Cockayne has bred it in one year in England and has described all stages. Comdr. Harper believes this was published ten or twelve years ago. The normal food plant is *Empetrum nigium* (Crowberry), and Comdr. Harper and his son have taken larvae and pupae from that plant, or under it, and bred moths. He has no knowledge of Alpine Lady's Mantle being a food plant, so it would appear that the presence of that plant in profusion where I obtained my series was purely coincidental.

P. C. le Masurier (978).

Printed by T. Buncle & Co. Ltd., Arbroath, and published by the Amateur Entomologists' Society, 1 West Ham Lane, London, E.15. 1955.

A Glossary for the Young Lepidopterist -	6d
Label List of British Macro-Lepidoptera -	1s 0d
Check List of British Macro-Lepidoptera -	3d

AES Leaflets

No.	Title	Price
1.	Collecting Coleoptera	3d
3.	Rearing Silkworms	3d
4.	Collecting Sawflies	6d
5.	Collecting Flies (Diptera)	2s 6d
6.	Collecting Beetles associated with Stored Food Products	1s 6d
7.	Some Improved Devices for Rearing Hymenoptera	6d
8.	Collecting Ants	6d
9.	Collecting Caddises	1s 0d
10.	Experiments with Bees	6d
12.	Collecting Dragonflies	6d
13.	Collecting Microlepidoptera	3d
14.	Setting Microlepidoptera	3d
15.	Collecting Heteroptera	6d
18.	Collecting Clearwings	6d
20.	Preserving Caterpillars	1s 0d
21.	Collecting Psocoptera	6d
22.	Collecting Lacewings	1s 0d
23.	Collecting Centipedes and Millipedes ...	6d
24.	Entomology of Bird Pellets	1s 6d
25.	Collecting Bumble Bees	2s 0d
26.	Collecting Collembola	1s 0d
27.	Insects of Wayfaring Tree	1s 6d

When 12 different leaflets are ordered a deduction of 10% from the total cost is allowed.

All these publications are obtainable from the Honorary Publications Secretary, C. BIGNELL PRATT, 1 WEST HAM LANE, LONDON, E.15. A remittance must accompany the order and sufficient to cover postage must be included. Postage on one leaflet is 1½d, on one volume 2d.

1960/61 (2)